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ABSTRACT

This document containing instructor lesson plans is one of three prepared to update a basic training program for emergency medical technicians (EMTs). (A course guide containing planning and management information and a study guide are available separately.) Material covers all emergency medical techniques currently considered to be within the responsibilities of the basic EMT providing emergency care with an ambulance service. The lesson plans include the following information: title, lesson time, and performance objectives for each lesson; lesson requirements for equipment, materials, illustrations, instructors, and facilities; specific instructor tasks; and lesson plan outlines for each of the twenty-five lessons included in the course. (BM)

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ED150323

Basic Training Course/ Emergency Medical Technician

(Second Edition)

Instructor's Lesson Plans

1977

U. S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D. C. 20590

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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Foreword

The National Highway Traffic Safety Administration has assumed responsibility for the development of training programs that are responsive to the standards established by the Highway Safety Act of 1966. Since these training programs are designed to provide national guidelines for training, it is NHTSA's intention that they be of the highest quality and be maintained in a current and up-to-date status from the point of view of both technical content and instructional strategy. To this end, NHTSA supported the current study which involved revision of selected curriculum packages deemed of high value to the States in carrying out their annual work programs.

The original package of the current training program was prepared in 1969 and was titled "Basic Training Program for Emergency Medical Technician—Ambulance." In general, the contents of the revised package reflect the original training program design. The current **instructor's lesson plans** document includes technical changes as well as format changes designed to aid the course instructor in his teaching task. The **course guide** has been updated to reflect the revised program and to be more responsive to the specific needs of the course coordinator. A **student study guide** has been prepared as an aid for the student; the original training package had no student guide.

Dr. Aaron Adams of NHTSA's Manpower Development Division served as Contract Technical Manager. Mr. Robert E. Motley of NHTSA's Emergency Medical Services Branch served as project advisor.

NHTSA is indebted to the American Academy of Orthopaedic Surgeons which provided prepublication copies of the second edition of its text on emergency medical care for use in preparing the revised curriculum package. This text, entitled "Emergency Care and Transportation of the Sick and Injured," served as the basic medical reference for the training program.

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Introduction

This **instructor's lesson plans** document is one of three documents prepared for the **Basic Training Program for Emergency Medical Technicians** (EMT's). It was prepared for the course instructors. As such, it contains detailed outlines of course content and guidance for teaching each course lesson. Two other documents complete the training package: a **course guide** which contains planning and management information required by the course coordinator to administer the training program and a **student study guide** which provides an overview of the objectives and content of each course lesson and includes study suggestions to aid trainees in achieving course objectives.

The training course covers all emergency medical techniques currently considered to be within the responsibilities of the basic EMT providing emergency care with an ambulance service. The course consists of 25 lessons involving 71 hours of classroom and field training plus 10 hours of in-hospital observation and training. The titles and times required for each of the 25 course lessons are given on the following page. The specified training times are minimal; actual training time (including clinical experiences) is expected to range from the recommended minimum of 81 hours to 120 hours or more depending on individual state program requirements.

The original **instructor's lesson plans** document was published in 1969. The program outlined at that time (or some adaptation of it) has been accepted by almost all states as a standard for training EMT's. Adaptations that have been made by individual states include additions in time and technical content and changes in training emphasis.

In order to be maximally useful to most states, it was determined that the basic structure of the course should remain essentially unchanged in the revision effort. The instructor will note, therefore, that most lesson titles in the second edition are the same as those in the first edition of the course, and only a few changes have been made in lesson sequence. The **major** program changes include a complete technical update, an early and continuing emphasis on patient assessment, and reinforcement throughout the course of the basic sequence of emergency care procedures. Thus the instructor will note that the primary patient survey for life-threatening problems has been introduced in Lesson 5 and the secondary survey for injuries not threatening to life has been introduced in Lesson 8. Both surveys are repeated throughout the training program as are basic emergency care procedures.

This **instructor's lesson plans** document includes a section for each course lesson. In general, lessons have been designed to be self-contained units. Each lesson consists of the following parts:

Title page and objectives. Specified here are the title of the lesson, total lesson time, and student performance objectives for the lesson.

Requirements. Specified here are lesson requirements for equipment, materials, illustrations, instructors, and facilities as appropriate.

Instructor tasks. Specified here are tasks the instructor should perform to prepare himself for teaching the lesson.

Lesson outline. This section includes a detailed outline of

the content of the lesson and the suggested instructional strategy. In addition, time estimates are provided for various lesson segments to provide a means by which the instructor can determine the emphasis to be given to a specific topic as well as to aid him in maintaining his lesson on schedule.

For the evaluation lessons, prepared written tests are required to evaluate student knowledges and checklists are required to provide for a standardized evaluation of student skills. Aids for developing the checklists are included in the evaluation lessons. It is assumed that all written tests and skill checklists will be developed by course instructors in coordination with the course coordinator.

The references used in the development of the program are included in each course lesson. They are summarized by lesson in the appendix.

Course Lessons

1. Introduction to Emergency Care Training—Course Scope, EMT Functions, Legal Considerations, Anatomy and Physiology, and Vital Signs (3 hrs.)
2. Airway Obstruction and Respiratory Arrest (3 hrs.)
3. Cardiac Arrest (3 hrs.)
4. Mechanical Aids to Breathing and Resuscitation (3 hrs.)
5. Bleeding, Shock and Practice on Airway Care, Pulmonary Resuscitation and Cardiopulmonary Resuscitation (3 hrs.)
6. Practice Test and Evaluation—Airway Care, Pulmonary Arrest, Cardiac Arrest, Bleeding and Shock (3 hrs.)
7. Wounds (3 hrs.)
8. Principles of Musculoskeletal Care and Fractures of the Upper Extremity (3 hrs.)
9. Fractures of the Pelvis, Hip and Lower Extremity (3 hrs.)
10. Injuries of the Head, Face, Neck and Spine (3 hrs.)
11. Injuries to the Eye, Chest, Abdomen and Genitalia (3 hrs.)
12. Practice, Test and Evaluation—Injuries I (3 hrs.)
13. Practice, Test and Evaluation—Injuries II (2½ hrs.)
14. Medical Emergencies I (3 hrs.)—ingested and inhaled poisons, bites and stings, heart attack, stroke, dyspnea
15. Medical Emergencies II (2½ hrs.)—diabetes, acute abdomen, communicable diseases, patients with abnormal behavior, alcohol and drug abuse, epilepsy
16. Emergency Childbirth (2½ hrs.)
17. Environmental Emergencies (2½ hrs.)—burns; exposure to heat, cold and water hazards
18. Lifting and Moving Patients (3 hrs.)
19. Field Exercises: Extrication from Automobiles (3 hrs.)
20. Practice, Test and Evaluation—Medical Emergencies, Emergency Childbirth, Environmental Emergencies, Lifting and Moving (3 hrs.)
21. Operations—Driving and Maintaining an Emergency Vehicle, Records and Reports, Communications, and Procedures at Emergency Departments (3 hrs.)
22. Responding to an Ambulance Call: A Review of Factors Affecting Ambulance Run Efficiency and Patient Assessment (2 hrs.)
23. Situational Review (3 hrs.)
24. Final Written Test (2 hrs.)
25. Final Practical Evaluation of Skills (3 hrs.)

Lesson 1

Introduction to Emergency Care Training—Course Scope, EMT Functions, Legal Considerations, Anatomy and Physiology, and Vital Signs

Objectives

Provide the student with sufficient information for him to:

Describe course scope and emphasis

Define the roles and responsibilities of the EMT

Describe personal attitudes and conduct expected of an EMT

Identify legal aspects of emergency care

Identify the major body systems and their general functions

Use the terminology of topographic anatomy

Describe the difference between a sign and a symptom

Identify the diagnostic signs and their normal states

Identify the medical identification symbol

Note: The instructor is advised that this lesson is introductory, and much of the information presented will be repeated and reinforced in subsequent lessons. The time provided is therefore minimal. If time and resources permit, the lesson may be subdivided to permit more depth in legal aspects of emergency care, anatomy and physiology, and vital signs.

Requirements

Equipment/material:

Schedule of lessons (one for each student)

Student Study Guide (one for each student)

Registration form (one for each student)

Skeleton

Torso with removable organs

Illustrations:

Anatomic charts of:
Skeletal system
Muscular system
Nervous system
Respiratory system
Circulatory system
Digestive system
Genitourinary system

Illustration of body in standard position

Illustration of medical identification symbol

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Be aware that much of the lesson is introductory in nature and will be repeated and reinforced in subsequent lessons.

3. Review references selected for the lesson by the course coordinator.[1]

4. Review all local laws, ordinances and regulations relative to provision of emergency care.

5. Review entire course to assure complete familiarity with its contents and procedures.

6. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.

7. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.

8. Formal evaluation of knowledge covered in this lesson will be accomplished in subsequent lessons.

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[1]The medical and legal contents of this lesson were based on information contained in the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 1, 2, 3, 4, 5, 7, 13, 15, 21, 25, and 28.

Time (Elapsed) Actual	Contents	Instructor Notes
Introduction (–) 0:05	1. Instructor introduction a. Name b. Title c. Affiliation Etc.	Describe responsibility relative to the course.
	2. Student welcome—acknowledgement that attendees are assembled for the first lesson of an 81-hour course in emergency medical care, designed to prepare students to become emergency medical technicians, or EMT's.	If the class is small and time permits, ask each student to introduce himself.
	3. Registration form completion.	Ask each student to complete registration form.
Need for Training (0:05) 0:05	1. The EMT's primary responsibilities are to bring expert emergency medical care to victims of emergencies, stabilize their conditions, and transport them safely and expeditiously to the hospital.	
	2. The EMT must perform his duties unsupervised, in a great variety of circumstances, and often under considerable physical and emotional stress.	
	3. The EMT typically represents the first component of the emergency medical care system. With proper training, he will be able to provide basic life support to victims of emergencies as well as minimize discomfort and further injury.	
	4. The actions of the EMT can mean the difference between life and death of the victim. Proper handling and care of the patient at the scene can minimize patient suffering and reduce recuperation time.	
	5. This course will provide **basic** training in all aspects of emergency medical care which an EMT is permitted to provide today. Advanced, continuing education and refresher training courses are also available as part of a career development pattern.	
	6. This course is the national standard for training emergency medical technicians.	
	7. The responsibilities associated with the EMT profession are major. It is therefore important that the student take his training responsibilities seriously by attaining 100% proficiency in all areas through punctuality, attendance, completion of assignments, class participation and full cooperation with the instructor.	
Course Purpose and Emphasis (0:10) 0:15	1. The course has been designed so that, upon successful completion, the student will be able to: a. Recognize the nature and seriousness of a patient's illness/injuries to assess requirements for emergency medical care.	

Time (Elapsed) Actual	Contents	Instructor Notes
	b. Administer appropriate emergency medical care to stabilize the patient's condition. c. Lift, move, position and otherwise handle the patient in such a way as to minimize discomfort and further injury. 2. It is obvious that the EMT provides a service in a special environment requiring special skills and knowledge in such areas as communication, transportation, record keeping and liaison with other emergency services. The course includes all operational functions considered to be within the roles and responsibilities of the EMT but does not attempt to develop proficiency in these areas. 3. The course emphasizes emergency medical care skills. However, it attempts to teach these skills in a job-related context.	
Course Scope and Materials (0:15) 0:15	1. **Course lessons** **Lesson 1. Introduction to Emergency Care Training—Course Scope, EMT Functions, Legal Considerations, Anatomy and Physiology, and Vital Signs (3 hrs.).** Overview of course, EMT roles and responsibilities , legal problems, vital signs, and anatomy and physiology. **Lesson 2. Airway Obstruction and Respiratory Arrest (3 hrs.).** Basic mechanics of respiration; signs of airway obstruction and respiratory arrest; maintaining an open airway; pulmonary resuscitation; and variations for infants, children and laryngectomees. **Lesson 3. Cardiac Arrest (3 hrs.).** Basic mechanics of circulation, signs of cardiac arrest, cardiopulmonary resuscitation by a lone rescuer and by a team of rescuers, and variations for infants and children. **Lesson 4. Mechanical Aids to Breathing and Resuscitation (3 hrs.).** Use of airways, suction equipment, oxygen equipment and delivery systems, and resuscitation devices. **Lesson 5. Bleeding, Shock and Practice on Airway Care, Pulmonary Resuscitation and Cardiopulmonary Resuscitation (3 hrs.).** Basic mechanics of circulation, determining blood pressure, signs of shock, preventing shock, signs of external and internal bleeding, controlling bleeding, performing an examination for life-threatening problems, taking blood pressure, additional practice on airway care, and pulmonary and cardiopulmonary resuscitation. **Lesson 6. Practice Test and Evaluation—Airway Care, Pulmonary Arrest, Cardiac Arrest, Bleeding and Shock (3 hrs.).** Test of knowledges taught thus far, and practice on and evaluation of skills taught thus far. **Lesson 7. Wounds (3 hrs.).** Anatomy and physiology of skin, signs and significance of various wound types, basic care of wounds, and dressing and bandaging wounds.	Refer to schedule of lessons. Indicate what instructor and student will accomplish in each lesson. Give time and place of each lesson. *(Note:* All times are minimum times.) Explain how the course emphasizes patient assessment and proper procedures of emergency care.

Time (Elapsed) Actual	Contents	Instructor Notes

Lesson 8. Principles of Musculoskeletal Care and Fractures of the Upper Extremity (3 hrs.). Anatomy and physiology of the musculoskeletal system; definitions and types of fractures and dislocations; signs and symptoms of fractures, dislocations and sprains, examining a patient for injuries; and techniques of immobilizing fractures and dislocations of the upper extremity.

Lesson 9. Fractures of the Pelvis, Hip and Lower Extremity (3 hrs.). Signs and symptoms of fractures and dislocations of the pelvis, hip and lower extremity; immobilizing fractures and dislocations of the pelvis, hip and lower extremity; practice in examining a patient for injuries.

Lesson 10. Injuries of the Head, Face, Neck and Spine (3 hrs.). Anatomy and physiology of the nervous system; signs and symptoms of spine fractures; general rules of caring for patients with spine injuries; signs of a skull fracture; caring for patients suffering from injuries to the skull, brain, face and neck; practice in immobilizing patients on short and long backboards.

Lesson 11. Injuries to the Eye, Chest, Abdomen and Genitalia (3 hrs.). Parts and functions of the eye, abdomen, digestive system and genito-urinary system; injuries to the eye, chest, abdomen, and genitalia; techniques of care; dressing and bandaging the eye and chest; practice in performing a complete patient examination for life-threatening problems and injuries.

Lesson 12. Practice, Test and Evaluation—Injuries I (3 hrs.). Test of knowledges on injuries to various body parts, and practice on and evaluation of skills in dressing and bandaging and performing a patient examination.

Lesson 13. Practice, Test and Evaluation—Injuries II (2½ hrs.). Practice on and evaluation of skills in immobilizing fractures of the upper extremity and lower extremity.

Lesson 14. Medical Emergencies I (3 hrs.). Causes, signs, symptoms and techniques of care for poison victims; victims of bites and stings; heart attack patients; stroke patients; patients suffering from dyspnea; practice in patient assessment; practice in cardiopulmonary resuscitation and using mechanical aids to airway care and resuscitation.

Lesson 15. Medical Emergencies II (2½ hrs.). Causes, signs, symptoms and techniques of care for diabetic patients, patients suffering from acute abdominal problems, patients with communicable diseases, patients with abnormal behavior, alcohol and drug abuse patients; epileptic patients, child patients; practice in patient assessment.

Lesson 16. Emergency Childbirth (2½ hrs.). Relevant anatomy, physiology, terms and emergency care equipment; delivery and care for the baby during normal and abnormal births; resuscitating the newborn; and care for the premature infant.

Lesson 17. Environmental Emergencies (2½ hrs.). Estimating the severity of a burn; caring for the burned

Time (Elapsed) Actual	Contents	Instructor Notes
	patient; special dangers of different types of burns (heat, chemical, electrical, radiation); signs, symptoms and techniques of care for the patient suffering from heat cramps, heat exhaustion, heat stroke and frostbite; and signs, symptoms and techniques of care for the patient exposed to water hazards.	
	Lesson 18. Lifting and Moving Patients (3 hrs.). Techniques of lifting and moving patients; immobilizing patients with suspected spine injury on short and long backboards; loading and unloading stretchers.	
	Lesson 19. Field Exercise: Extrication from Automobiles (3 hrs.). Principles and considerations involved in gaining access to and extricating persons from automobiles, packaging and removing patients with suspected spine and other injuries from automobiles; and removing patients from beneath automobiles.	
	Lesson 20. Practice, Test and Evaluation—Medical Emergencies, Emergency Childbirth, Environmental Emergencies, Lifting and Moving (3 hrs.). Test of knowledges on medical emergencies, emergency childbirth, environmental emergencies, and lifting and moving patients; practice on and evaluation of skills in emergency childbirth, lifting and moving, immobilization on long and short backboards and patient assessment.	
	Lesson 21. Operations—Driving and Maintaining an Emergency Vehicle, Records and Reports, Communications, and Procedures at Emergency Departments (3 hrs.). Overview of EMT procedures and responsibilities in the listed operational areas.	
	Lesson 22. Responding to an Ambulance Call—A Review and Integration of Factors Affecting Ambulance Run Efficiency and Patient Assessment (2 hrs.). Review and integration of knowledge learned during the course by discussion of considerations involved in phases of an ambulance run; patient examination and assessment; review of vital signs and their implications.	
	Lesson 23. Situational Review (3 hrs.). Review of course contents by group discussion of situational examples.	
	Lesson 24. Final Written Test (2 hrs.). Test of knowledges learned in the emergency care course.	
	Lesson 25. Final Practical Evaluation of Skills (3 hrs.). Evaluation of skills learned in the emergency care course.	Identify requirements for course completion.
	2. **In-hospital training.** In addition to the 25 lessons, the course includes 10 hours of in-hospital observation and training.	Describe nature of training planned for the course and where and when it will take place.
	3. **Materials.** Identification of:	
	a. Recommended text(s), references, reading assignments	
	b. Design and use of the Student Study Guide	
Objectives of Lesson 1 (review) (0:30) 0:05	1. Describe course scope and emphasis.	Refer to lesson objectives in the Student Study Guide and review with class. Emphasize the introductory nature of the lesson.
	2. Define the roles and responsibilities of the EMT.	
	3. Describe personal attitudes and conduct expected of an EMT.	

Time (Elapsed) Actual	Contents	Instructor Notes
	4. Identify legal aspects of emergency care.	
	5. Identify the major body systems and their general functions.	
	6. Use the terminology of topographic anatomy.	
	7. Describe the difference between a sign and a symptom.	
	8. Identify the diagnostic signs and their normal states.	
	9. Identify the medical identification symbol.	
Role and Responsibilities of the EMT (0:35) 0:10	1. As indicated previously, the EMT's primary responsibility is to the patient. His patient care role includes:	Indicate how these roles and responsibilities are covered in the course.
	a. Careful examination of the patient for signs and symptoms of illness/injuries.	
	b. Prompt and efficient care of the patient and stabilization of his condition prior to transport.	
	c. Careful handling of the patient in moving him to the ambulance vehicle.	
	d. Safe and efficient transport of the patient while constantly monitoring the patient and providing any appropriate continuing care.	
	e. Orderly transfer of the patient to the hospital emergency department.	
	2. In addition to the preceding patient responsibilities, he may need to perform the following functions if other emergency services are not available at the accident scene:	
	a. Use basic tools and procedures to gain access to and disentangle the patient from the vehicle.	
	b. Control the accident scene, including parking his vehicle in such a way as to minimize further danger in the roadway as well as controlling the actions of bystanders.	
	3. Other functions considered an integral part of the EMT's job are as follows:	
	a. Communications—This role includes obtaining information regarding the emergency from the dispatcher, communicating with other emergency services as needed during the ambulance run (proceeding to the scene, at the scene, and proceeding to the hospital), and alerting hospital emergency department staff of the arrival of critical patients. The EMT, of course, must follow FCC regulations relative to the use of communications equipment.	
	b. Reporting and record keeping—In addition to records maintained for the ambulance service, the EMT will need to obtain and record information required by medical, legal and health authorities as required.	Give examples.

Time (Elapsed) Actual	Contents	Instructor Notes
	c. Vehicle driving, maintenance and care—The EMT will need to drive his vehicle safely and defensively at all times. In addition to routine vehicle maintenance, he will need to check his vehicle after each run for level of gas, adequacy of equipment and supplies, cleanliness, etc. He will also need to make a daily check of his vehicle equipment and systems.	
	4. The EMT will need to learn a good deal about the area in which he provides services and will need to exercise a good deal of judgment in carrying out these services. For example:	
	a. Enroute to the scene—The EMT will need to use the appropriate route depending on time of day, nature of the event, etc. He will need to plan ahead regarding equipment he might need to take with him when he leaves the vehicle, etc.	Give examples.
	b. At the scene—The EMT will need to examine patients, perform triage as necessary and render appropriate care.	Give examples.
	c. Enroute to the hospital—The EMT will need to monitor the patient constantly and provide continuing care.	Give examples.
	d. At the hospital—The EMT will need to unload the patient carefully, communicate all needed information to the hospital emergency department staff, assist hospital personnel as necessary, etc.	Give examples.
	5. Summary of functions:	List on chalkboard.
	a. Patient examination	
	b. Prompt and efficient care	
	c. Appropriate patient handling	
	d. Safe and efficient patient transport	
	e. Orderly transfer of patient to emergency department	
	f. Communications	
	g. Reporting and record keeping	
	h. Vehicle driving, maintenance and care	
	i. **If rescue crews are absent,** gain access to and disentangle patient	
	j. **If police are absent,** control the accident scene	
Personal Attitudes and Conduct of the EMT (0:45) 0:05	1. **Professional manner,** i.e., controls emotion, is courteous, uses proper tone of voice, is confident, chooses appropriate types of conversation, does not smoke while administering care, etc.	Emphasize importance of a calm professional manner.
	2. **Appearance,** i.e., well groomed, clean, wears proper uniform and insignia, etc.	
	3. **General conduct,** i.e., shows interest in job, reflects concern for patient, is a good team worker, prevents embarrassment to patients, gives patient reassurance, shows responsibility for safety of all involved, uses	

Time (Elapsed) Actual	Contents	Instructor Notes
	patient's resourcefulness in helping himself, is cooperative with others involved in providing aid, etc.	
Ten-Minute Break (0:50) 0:10		
Legal Problems Relative to Emergency Care (1:00) 0:20	1. **Duty to act**—responsibilities relative to responding to the need for care. 2. **Standard of care.** Elements which make up a standard of care include: a. ***The type of individual and community conduct***—the individual is judged in comparison with other hypothetical persons of similar training and experience. b. ***Standards imposed by force of law***—these are standards imposed by statutes, ordinances, case law, or administrative orders. c. ***Professional or institutional standards***—these are published recommendations of organizations and societies involved in emergency work and specific rules of procedure of the service of which the EMT is a part.	Give examples of all legal problems. Emphasize that the EMT will need to keep up to date relative to legal requirements in the area in which he provides services. Cover local ordinances relative to child abuse, foul play, death, rape.
	3. **Consent** a. ***Actual consent.*** To be effective, it must be an informed consent. Oral consent is valid. A consent form does not eliminate the need for conversation. b. ***Implied consent.*** In a true emergency in which there is a significant risk of death, disability or deterioration of condition, the law assumes that the patient would give his consent. c. ***Minor's consent.*** The right to consent is usually given to the parent or other person so close to the minor as to be treated as a parent. d. ***Consent of the mentally ill.*** The situation is similar to that for minors.	Emphasize importance of patient communications.
	4. **The right to refuse treatment.** A competent adult has the right to refuse treatment for himself or a minor due to religious or other reasons.	
	5. **Immunities** a. ***Government immunities.*** Some government employees are immune to prosecution. b. ***Good Samaritan laws.*** Some states grant immunity to those who volunteer to help an injured person at the scene of an accident. c. ***EMT and paramedic statutes.*** Some states have laws specifically enacted to protect EMT's, paramedics and physicians who give them instructions via radio.	

Time (Elapsed) Actual	Contents	Instructor Notes
	d. ***Exemption from the Medical Practice Act.*** Nearly every state exempts emergency treatment from the licensure requirements of the Medical Practice Act for the non-professional.	
	e. ***Effect of licensure and certification.*** Some states have licensing and certification requirements that obligate the individual to conform to a standard of care.	
Overview of Anatomy and Physiology (1:20) 0:30	1. **Skeletal system and body cavities.** The skeletal system consists of the bones that form the supporting framework of the body; they also protect body organs.	Explain that this lesson covers only a brief overview of anatomy and physiology. Each system will be covered in subsequent lessons.
	a. ***Skull.*** The Skull consists of the cranium (which contains the brain) and the face.	
	b. ***Spinal column***	Display anatomic chart and identify major system elements and body cavities.
	1) The spinal column encloses the spinal cord.	
	2) The brain connects with the spinal cord through a large opening at the base of the skull in the center of the upper neck.	If available, refer to skeleton and torso with removable organs.
	3) The spinal column is the central supportive bony structure of the body and consists of 33 bones known as vertebrae.	
	4) The spine is divided into five sections: a) Cervical spine—neck b) Thoracic spine—upper back c) Lumbar spine—lower back d) Sacrum e) Coccyx or tail bone	
	c. ***Upper extremities***	
	1) The upper extremities extend from the shoulders to the fingertips.	
	2) The bone in the upper arm is known as the humerus.	
	3) The bones in the lower arm are known as the radius and ulna.	Identify each bone.
	d. ***Thoracic (rib) cage***	
	1) The chest is enclosed by 12 ribs which are attached to the thoracic vertebrae in back; the top 10 ribs are attached to the sternum (breastbone) in front.	
	2) The clavicle (collarbone) connects with the sternum (breastbone).	
	3) The rib cage encloses the heart and lungs—the vital organs of the body.	
	4) The diaphragm is a muscle which moves up and down while breathing; it separates the chest cavity from the abdominal cavity.	Explain how diaphragm works.
	e. ***Abdominal cavity***	
	1) The back boundary of the abdominal cavity consists of: a) The lumbar spine b) The sacrum c) The coccyx (tail bone)	
	2) The abdomen contains organs of digestive and excretion including the liver, gallbladder, spleen,	

Time (Elapsed) Actual	Contents	Instructor Notes
	pancreas, kidneys, stomach, intestines, bladder and rectum.	
	3) The abdomen also contains female reproductive organs.	
	4) The lower part of the abdomen is more properly called the pelvic cavity.	
	f. ***Pelvic cavity***	
	1) The pelvic cavity is bounded by the sacrum, hip bones and the pubis; it is continuous with the abdominal cavity.	
	2) The pelvic cavity protects the lower abdomen: the bladder, the rectum and the internal female sexual organs.	
	g. ***Lower extremities***	
	1) The lower extremities extend from the hips to the toes.	
	2) The bone in the upper leg (thigh) is known as the femur.	
	3) The bones in the lower leg are known as the tibia and fibula.	Identify each bone.
	2. **Muscular system.** The muscular system consists of the tissue that contracts and relaxes to permit body movement or functions.	Refer to anatomic chart.
	a. ***Voluntary muscles***—those which we control at will, for example, the skeletal muscles that permit us to move.	
	b. ***Involuntary muscles***—those which work automatically, for example, the diaphragm which permits us to breathe.	Give other examples.
	c. ***Cardiac muscle***—the walls of the heart are a special type of involuntary muscle that keep the heart functioning automatically.	
	3. **Nervous system.** The nervous system consists of the brain, spinal cord and nerves that control and permit all body activities and sensations. A muscle will not move if the nerves which serve it are cut.	Refer to anatomic chart.
	4. **Respiratory system.** The respiratory system consists of the organs of the body which permit us to breathe. It provides for the intake of oxygen needed by the body to survive and the release of carbon dioxide and other substances. Main elements are:	Refer to anatomic chart.
	a. Nose and mouth	
	b. Pharynx	
	c. Larynx	
	d. Trachea	
	e. Bronchi	
	f. Lungs	
	5. **Circulatory system.** The circulatory system consists of the heart (a pump) and a system of arteries which transport blood containing oxygen to all body systems,	Refer to anatomic chart.

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	capillaries through whose thin walls oxygen and other products are exchanged with body cells, and veins which transport blood containing waste products from body cells to be eliminated.	
	6. **Digestive system.** The digestive system consists of the organs which permit us to eat, digest, and eliminate foods, including:	Refer to anatomic chart.
	a. Mouth and throat b. Esophagus c. Stomach d. Liver e. Gallbladder f. Pancreas g. Intestines h. Rectum	
	7. **Genitourinary system.** The genitourinary system consists of the organs which permit us to eliminate certain waste materials filtered from the blood and to reproduce, including:	Refer to anatomic chart.
	a. Kidneys b. Ureter c. Urethra d. Bladder e. Male and female reproductive organs	
Ten-Minute Break (1:50) 0:10		
Topographic Anatomy (2:00) 0:15	1. Right and left—the patient's right and left.	Refer to illustration of body in standard position and give examples of each term.
	2. Surface: a. Anterior—front b. Posterior—rear	
	3. Midline—a vertical line dividing the body into right and left halves.	
	4. Proximal and distal: a. Proximal—location on an extremity which is nearer to the trunk; location on the trunk which is nearer to the midline or to the point of reference named. b. Distal—opposite of proximal.	
	5. Superior and inferior: a. Superior—toward the head b. Inferior—toward the feet	

Time (Elapsed) Actual	Contents	Instructor Notes
	6. Student practice	Have class practice use of each term.
Diagnostic Signs (2:15) 0:30	1. **Signs vs. symptoms.** Throughout the course, reference will be made to signs and symptoms; therefore, an initial definition of their meaning is in order: a. A ***sign*** is something the rescuer sees, hears or feels; for example, a pale face, no respirations, cold skin. b. A ***symptom*** is something the patient tells about himself, that is, he feels nauseous, his back hurts, he has no sensation in the extremities.	Indicate that this lesson provides only an overview of diagnostic signs. Each sign will be repeated in subsequent lessons and the EMT will learn to put them together into a diagnosis of a patient's condition.
	2. **Use in diagnosis.** The rescuer will learn many signs and symptoms throughout the course and will learn to combine them into a meaningful diagnosis of the patient's condition.	
	3. **Overview of signs.** A brief overview of the important diagnostic signs is given below: a. ***Pulse*** 1) The pulse is the pressure wave generated by the heartbeat and carried along the arteries. 2) The normal pulse rate for adults is 60 to 80 beats per minute; a normal rate for children is 80 to 100 beats per minute. 3) The pulse is taken anyplace where an artery passes over a bony prominence or lies near the skin. 4) The pulse can be: a) Absent b) Slow or fast c) Weak or pounding d) Irregular	Have each class member find his own radial and carotid pulses.
	b. ***Respirations*** 1) The normal respiratory rate can vary widely. It is usually between 12 and 20 breaths per minute. 2) Respirations may be heard or felt at the nose and mouth, and the chest can be seen rising and falling. 3) Respirations can be: a) Absent b) Slow or fast c) Shallow or deep d) Gasping, labored, or choking	
	c. ***Blood pressure*** 1) Blood pressure is the pressure that the circulating blood exerts against the walls of the arteries. It is measured in mm Hg at two levels: a) Systolic—contraction of heart b) Diastolic—relaxation of heart 2) It is measured by a device known as a sphygmomanometer. 3) Blood pressure varies with age and sex. In the male, normal systolic is about 100 plus the age of the patient up to 140 to 150 mm Hg. Normal diastolic is 65 to 90 mm Hg. Both pressures are 8 to 10 mm Hg lower in females.	

Time (Elapsed) Actual	Contents	Instructor Notes
	4) Blood pressure: a) Can be high b) Can be low c) Can fall rapidly	
	d. ***Temperature***	
	1) Normal body temperature is 98.6°.	
	2) In emergency care, temperature is estimated by feel using the back of the hand on the patient's skin.	
	3) The skin is largely responsible for temperature regulation by radiation of heat and evaporation of water.	
	4) The skin can be: a) Cold or hot b) Wet, clammy or dry	
	e. ***Skin color***	
	1) Skin color is a useful sign for lightly pigmented people.	
	2) Skin color can be: a) White, pale or ashen b) Red or flushed c) Blue (for people with dark pigmentation, blue may be noted around the fingernails, palms of hands, and mouth)	
	f. ***Pupils of the eyes***	
	1) The pupils of the eyes are normally equal in size and constrict when exposed to light.	
	2) Pupils can be: a) Dilated b) Constricted c) Unequal d) Fixed	
	g. ***State of consciousness***	
	1) The normal person is alert, oriented and responds to vocal or physical stimuli.	
	2) A person's state of consciousness may range from normal to mildly confused, disoriented, or unconscious.	
	h. ***Inability to move on command***—an indicator of paralysis.	
	1) The normal conscious person can move his body when requested to do so.	
	2) A person may not be able to move his legs, both his arms and his legs, or one side of his body.	
	i. ***Reaction to pain***—an indicator of paralysis.	
	1) The normal person can feel someone touch his body.	
	2) A person may have no sensation or a numb feeling in arms and/or legs or certain parts of the body.	
	4. Medical identification symbols	Refer to illustration of medical identification symbol.
	a. People with special medical problems (for example, diabetes, epilepsy, acute allergic reactions) frequently wear a medical identification symbol on which the nature of the problem is indicated.	

Time (Elapsed) Actual	Contents	Instructor Notes
	b. These are usually worn as a bracelet or necklace but may be carried in card form in a purse or wallet. c. The EMT should always search for such symbols on unconscious or stuperous patients since they can give valuable information about the wearer and care that he needs.	
Summary and Questions (2:45) 0:15 (3:00)	1. Class questions or comments on the topic of the lesson. 2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on selected objectives.

Lesson 2

Airway Obstruction and Respiratory Arrest

Objectives

Provide the student with sufficient information for him to:

Describe the importance of oxygen to the body, particularly the brain

Identify components of the respiratory system and explain how the system works

Describe the signs of adequate and inadequate breathing

Describe airway care and resuscitation procedures for patients with and without spine injuries, for neck breathers, and for infants and small children

Provide the student with sufficient practice for him to:

Demonstrate on a manikin the techniques for opening an airway obstructed by the tongue for patients with and without suspected spine injuries

Demonstrate on a manikin use of blows to dislodge foreign objects from the airway for patients with and without suspected spine injuries

Demonstrate on an upright and supine manikin the abdominal and chest thrust methods for dislodging foreign objects from the airway

Demonstrate on an adult manikin the mouth-to-mouth and mouth-to-nose techniques of pulmonary resuscitation

Demonstrate on an infant manikin the mouth/nose technique of pulmonary resuscitation

Requirements

Equipment/material:

Adult resuscitation manikin (one for each 6 students)

Infant resuscitation manikin (one for each 6 students)

Antiseptic solution and gauze pads

Suggested illustrations (chart, slide, drawing, model):

Respiratory system

Alveoli

Lungs, rib cage, pleura, diaphragm

Airway obstruction by tongue

Trachea of partial and total neck breathers

Instructors:

One for each 6 students during practice period

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.

2. Review references selected for the lesson by the course coordinator.[1]

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[1]The contents of this lesson were based on the following references:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured** (Second Edition) Chicago, Illinois, 1977. Chapters 5 and 10.

Standards for cardiopulmonary resuscitation (CPR) and emergency cardiac care (ECC). JAMA, Vol. 227, No. 7 (Supplement), 18 February 1974.

3. Assure that all basic life support procedures conform to the latest recommendations made by your State Heart Association.

4. Use the references and your own knowledge and experience to enrich the lesson outline as appropriate when you deliver your lecture.

5. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.

6. Assure that all equipment required for the lesson is available.

7. Brief all instructor aides regarding their roles and responsibilities during the lesson.

8. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.

9. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage** a. Design of the respiratory system and how it functions to supply the body with oxygen. b. Signs of adequate and inadequate breathing. c. Methods of maintaining an open air passage. d. Methods of resuscitating the non-breathing patient.	Review lesson coverage and objectives. Emphasize criticality of skills and knowledge covered.
	2. **Importance of oxygen and respiratory system** a. ***All living cells.*** All living cells of the body require oxygen to survive. b. ***Brain cells*** 1) For cells in the brain and nervous system, oxygen is particularly important. 2) Without oxygen, they will die in 4 to 6 minutes. 3) If brain cells die, the patient may still live, but he will be a vegetable. c. ***Respiratory system.*** The respiratory system provides the means by which oxygen is delivered to the body and carbon dioxide and other gases are removed.	
	3. **Criticality of lesson** a. A non-breathing patient or a patient with breathing difficulties is a true emergency. b. Skills learned in this lesson are critically important. c. Speedy and correct performance of these skills may mean the difference between life and death to the patient.	
	4. **Lesson objectives.** At the end of the lesson, each student will be able to: a. Describe the importance of oxygen to the body, particularly the brain. b. Identify components of the respiratory system and explain how the system works. c. Describe the signs of adequate and inadequate breathing. d. Describe airway care and resuscitation procedures for patients with and without spine injuries, for neck breathers, and for infants and small children. e. Demonstrate on a manikin the techniques for opening an airway obstructed by the tongue for patients with and without suspected spine injuries. f. Demonstrate on a manikin use of blows to dislodge foreign objects from the airway for patients with and without suspected spine injuries.	Refer to lesson objectives in the Student Study Guide and review with class.

Time (Elapsed) Actual	Contents	Instructor Notes
	g. Demonstrate on an upright and supine manikin the abdominal and chest thrust methods for dislodging foreign objects from the airway.	
	h. Demonstrate on an adult manikin the mouth-to-mouth and mouth-to-nose techniques of pulmonary resuscitation.	
	i. Demonstrate on an infant manikin the mouth/nose technique of pulmonary resuscitation.	
The Respiratory System (0:10) 0:10	1. **Anatomy and physiology**	Refer to illustration of respiratory system. Review design and function of each system element.
	a. ***Pharynx.*** Air entering the nose or mouth or food entering the mouth passes to the pharynx.	
	b. ***Trachea***	
	1) At the base of the pharynx are two passageways.	
	2) The esophagus (in back) takes food and liquids to the stomach.	
	3) The trachea (in front) takes air to the lungs and is is known as the windpipe.	
	c. ***Epiglottis***	
	1) A valve called the epiglottis guards the opening of the trachea.	
	2) It closes when food or liquids are present in the pharynx.	
	3) Occasionally foods or liquids get past the epiglottis and cause an emergency situation.	
	d. ***Larynx***	
	1) The larynx is the first part of the trachea.	
	2) It is the "voice box" which contains the vocal cords permitting us to speak.	
	3) The Adam's apple is the front portion of the larynx.	
	e. ***Bronchi.*** The trachea divides into two smaller tubes, the right and left bronchi, which enter the lungs.	
	f. ***Lungs***	Refer to illustration of alveolia.
	1) In the lungs, the bronchi branch into smaller parts until they finally end in millions of tiny air sacs, called alveoli.	
	2) Oxygen passes through the thin walls of the alveoli to tiny capillaries.	
	3) Carbon dioxide and other waste gases pass from the capillaries to the alveoli and are breathed out into the atmosphere.	
	g. ***Diaphragm and rib muscles***	Refer to illustration of lungs, rib cage, pleura and diaphragm.
	1) The diaphragm is a muscle that separates the chest cavity from the abdominal cavity.	
	2) When the diaphragm and rib muscles contract, the chest cavity enlarges and fills with air.	
	3) When the muscles relax, the space becomes smaller and air is forced out.	

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	4) The mechanics of breathing can be compared to the operation of a bellows: when it is open, air enters; as it closes, air is forced out.	
	h. ***Pleura***	
	1) The layer of slippery tissue covering the lungs is known as the pleura. A layer of this tissue also lines the chest cavity. In between is a thin layer of fluid.	
	2) When the chest expands, the lung is pulled with it and expands by suction exerted through the pleura.	
	3) If either of these pleura is torn, the capability for normal expansion of the lungs is lost.	
	2. **Control of breathing**	
	a. Breathing is controlled by the brain.	
	b. Although we can hold our breath or breathe faster or deeper if we wish, we cannot maintain these conditions indefinitely.	
	c. The brain is aware of oxygen and carbon dioxide levels in all parts of the body. When these become abnormal, it will override other conditions (e.g., holding one's breath) and take over operation of the respiratory system.	
Signs (0:20) 0:05	1. **Adequate breathing**	Demonstrate checking a manikin for signs of breathing.
	a. Chest and abdomen **rise** and **fall** as air is breathed in and out.	
	b. In most cases, air can be **heard** coming out of the mouth.	
	c. Air can be **felt** coming out of the nose and mouth.	
	2. **Inadequate breathing**	
	a. No air can be heard or felt at the nose and mouth, or the patient is struggling to breathe and muscles on the front of the neck stand out prominently.	
	b. The breathing is noisy or has a bubbling sound.	
	c. The breathing is slow; normal breathing rate for adults is between 12 and 20 breaths per minute.	
	d. The patient is cyanotic.	
	1) Cyanosis is a grayish-blue discoloration of the skin and membranes around the lips, ears, nailbeds and sometimes the whole body.	
	2) For non-whites, the nails, palms of hands and mouth should be examined for signs of cyanosis.	
Opening the Airway (0:25) 0:10	1. **Obstruction by the tongue.** In an unconscious patient, muscles relax and the tongue can fall back and obstruct the airway.	Refer to illustration of airway obstruction by the tongue.
	2. **Techniques of care**	
	a. ***Head-tilt maneuver.*** By placing one hand on the	

Time (Elapsed) Actual	Contents	Instructor Notes
	patient's forehead and the other under his neck, the head is tilted back and the neck is extended.	
	b. ***Chin-lift head-tilt maneuver.*** The lower jaw is lifted by the fingers of one hand and moved forward. The other hand presses on the forehead to tilt the head back.	
	c. ***Jaw-thrust maneuver.*** If the head-tilt methods are not effective, the EMT should place his fingers behind the angles of the patient's lower jaw, forcefully bring the jaw forward, tilt the head backward and pull the lower lip down with the thumbs.	
	d. ***Face-down position.*** Placing the patient on his side permits the tongue to fall forward and the airway to open. It also permits saliva and mucus to drain out. The neck should be extended.	
	Note: These techniques should not be used if a broken neck or upper spinal cord injury is suspected.	
	3. **Need for pulmonary resuscitation.** If breathing does not start spontaneously, artificial respiration should be started immediately.	
	4. **Suspected spine injuries**	
	a. ***Problem***	
	1) A cervical spine injury must be suspected in all accident cases.	
	2) Hyperextension of the neck and any movement of the head must be avoided in order to prevent further injury to the spine.	
	b. ***Technique.*** To open the airway, the EMT uses a modified jaw-thrust maneuver. The EMT should:	Demonstrate on a manikin.
	1) Place his hands on either side of the patient's head so the neck is maintained in a fixed, neutral position without being extended.	
	2) Use the index fingers to move the jaw forward	
Pulmonary Resuscitation (0:35) 0:15	1. **Oxygen in inhaled and expired air**	
	a. The atmosphere contains about 21% oxygen.	
	b. Of the 21% inhaled, 5% is used by the body and the remainder (16%) is exhaled.	
	c. Thus a rescuer can deliver 16% oxygen to a non-breathing patient by using his own exhaled breath.	
	2. **Mouth-to-mouth technique.** Procedures are:	
	a. Open the airway—place one hand on the patient's forehead and one under neck to hyperextend neck.	Demonstrate on a student or manikin.
	b. Pinch the nose closed using thumb and index finger of hand exerting pressure on the forehead.	
	c. Open mouth widely, take a deep breath, make a tight seal around the patient's mouth, and blow air into the patient's mouth until the chest rises.	

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	d. Remove the mouth to allow air to come out of the patient's airway.	
	e. To start, give four breaths in rapid succession without waiting for the lungs to deflate completely.	
	f. Ventilate the lungs 12 times per minute (once every 5 seconds).	
	3. **Mouth-to-nose technique**	
	a. It may be difficult or impossible to use the mouth-to-mouth technique for many reasons; for example:	
	1) There may be a severe injury in the mouth region.	
	2) The rescuer may not be able to make a tight seal because the patient has a large mouth, no teeth, etc.	
	b. Procedures are:	
	1) Tilt the patient's head back with one hand on the forehead.	Demonstrate on a manikin.
	2) Use the other hand to lift the patient's lower jaw; this seals the lips.	
	3) Take a deep breath, seal the lips around the patient's nose and blow until the chest rises.	
	4) Remove mouth and let patient exhale.	
	5) If necessary, open patient's mouth during exhalation.	
	6) Give four deep and quick breaths to start and then repeat cycle every 5 seconds as with the mouth-to-mouth technique.	
	4. **Variations for infants.** Procedures for infants and small children are:	
	a. Do not exaggerate the head tilt since forceful backward tilting may obstruct breathing passages.	Demonstrate on an infant manikin.
	b. Make a seal around **both** mouth **and** nose.	
	c. Use less volume to inflate the lungs.	
	d. Inflate lungs once every 3 seconds.	
	5. **Variations with jaw thrust maneuver**	
	a. For mouth-to-mouth resuscitation, use the cheek to seal the nose—this is difficult and tiring to perform.	Demonstrate on a manikin.
	b. For mouth-to-nose resuscitation, use the cheek to seal the mouth and do not retract the lower lips with the thumbs	
	6. **Gastric distention**	
	a. Artificial ventilation frequently causes distention of the stomach.	Demonstrate on a manikin.
	b. Slight distention should be ignored.	
	c. If there is marked distention, moderate pressure should be exerted by one hand between the navel and the rib cage.	
	d. If the patient vomits, his head and shoulders should be turned to one side to prevent aspiration.	

Time (Elapsed) Actual	Contents	Instructor Notes
Ten-Minute Break (0:50) 0:10		
The Laryngectomee (Neck Breather) (1:00) 0:10	1. **The condition** a. Some persons have all or part of their larynx removed through surgery. b. These persons have a hole (known as a stoma) in the trachea. c. Those whose complete larynx has been removed breathe only through the stoma. d. Those whose larynx has been partially removed breathe both through the stoma and through the nose and mouth. In the partial neck breather, a tube graft from just within the stoma connects with the base of the tongue and provides a so-called speaking tube. e. Laryngectomees are rare; however, the rescuer should be aware that such individuals exist and how to care for them. If there is no exhaled air at nose and mouth, he should always check the patient's neck. 2. **Airway care procedures** a. Remove all coverings (e.g., scarves, ties, necklaces) from the stoma area. b. Clear the stoma of foreign matter. c. Make a seal with your mouth over the stoma and blow until the chest rises. d. If the chest does not rise, suspect a partial neck breather and seal the nose and mouth with one hand and repeat the process. To seal the nose and mouth, pinch off the nose between the third and fourth fingers, seal the lips with the palm of the hand, place the thumb under the chin and press upward and backward. e. When the chest rises, remove your mouth from the stoma and permit the chest to fall.	Refer to illustration of trachea of partial and total laryngectomees.
Airway Obstruction (1:10) 0:20	1. **Importance of ventilating lungs first** a. The rescuer should **not** look for foreign bodies in the airway unless their presence is known or strongly suspected. b. Efforts to ventilate the lungs will reveal whether foreign bodies are present. 2. **Loose material** a. Foreign material (blood, mucus, phlegm, loose teeth, food, etc.) in the airway can prevent successful ventilation of the lungs. If attempts at ventilation are unsuccessful, the EMT should:	

Time (Elapsed) Actual	Contents	Instructor Notes
	1) Turn the patient's head to one side.	Demonstrate on a manikin.
	2) Force the mouth open by applying pressure with the thumb on the upper back molars and with the index finger on the lower back molars—the "cross-finger" technique.	Demonstrate on self or manikin. Ask each student to perform technique on himself.
	3) Sweep the index and middle fingers of the other hand across the back of the patient's throat.	
	4) Roll head back and attempt artificial ventilation.	
	b. If a spine injury is suspected, the EMT should maintain the patient's head, neck and torso in strict alignment.	Demonstrate on a manikin and student.
	3. **Lodged material**	
	a. If the patient is choking from a foreign object caught in his throat, emergency care procedures include back blows and manual thrusts.	
	1) *Back blows.* The EMT should deliver sharp blows with the heel of the hand to the patient's spine between the shoulder blades.	Demonstrate on a manikin and student.
	Note: Infants and small children should be picked up, and inverted over the EMT's arm. The EMT should deliver light blows between the shoulder blades.	
	2) *Abdominal thrust*	
	a) *Procedures.* The EMT should:	
	Stand behind a standing or seated patient and wrap his arms around his waist.	Demonstrate on a manikin.
	Grasp one fist with the other hand and place the fist, thumbside, against the patient's abdomen, slightly above the navel and below the xiphoid.	Ask each student to demonstrate **hand position** on a fellow student. Do **not** perform actual maneuver.
	Press the fist into the patient's abdomen with a quick upward thrust.	
	Note: The pressure should be diminished for a child.	
	b) *Variation.* The technique can be performed on a supine patient by placing one hand on the other, placing the heel of the bottom hand on the abdomen as above, and pressing into the abdomen with a sharp upward thrust.	Demonstrate on a manikin.
	3) *Chest thrust.* The chest thrust can be used when the patient is markedly obese or pregnant.	
	a) *Procedure.* The EMT should:	
	Stand behind a standing or seated patient and wrap his arms around the patient's lower chest.	Demonstrate on a manikin.
	Grasp one fist with the other hand and place the fist, thumbside, against the lower sternum above the xiphoid.	Ask each student to demonstrate **hand position** on a fellow student. Do **not** perform actual maneuver.
	Press the fist into the patient's chest with a quick backward thrust.	
	b) *Variation.* For a supine patient, the EMT should:	Demonstrate on a manikin.
	Place one hand on either side of the lower chest with the heels of the hands in line with	

Time (Elapsed) Actual	Contents	Instructor Notes
	the armpits and the fingers wrapped around the side of the patient's chest.	
	Squeeze the chest with a quick downward thrust of the arms and inward thrust of the hands.	
	4) *Combined procedures*	**Follow latest Heart Association procedures.**
	a) *Conscious adult* (or witnessed)	
	Identify complete obstructon.	Demonstrate on a manikin.
	Alternate back blows and manual thrusts until effective or patient loses consciousness.	
	b) *Patient becomes unconscious*	Demonstrate on a manikin.
	Place patient supine.	
	Open airway: attempt ventilation; if unsuccessful: Give back blows. Perform manual thrusts. Check for foreign body.	
	Attempt ventilation and repeat as necessary.	
	c) *Patient found unconscious*	Demonstrate on a manikin.
	Establish unresponsiveness.	
	Open airway; establish breathlessness.	
	Attempt to ventilate.	
	If unsuccessful, reposition head and try again.	
	If unsuccessful, check for foreign body.	
	If none, Give back blows. Perform manual thrusts. Check for foreign body.	
	Attempt ventilation and repeat as necessary.	
Practice (groups of no more than 6 students per manikin) (1:30) 1:15	1. Each student should practice the following skills on an adult manikin:	Divide class into groups of 6.
	a. Head-tilt maneuver.	Monitor and critique each student. Permit student to practice until they can perform each step without error.
	b. Chin-lift head-tilt maneuver.	
	c. Jaw-thrust maneuver (if difficult to perform on the manikin, student should describe procedures).	
	d. Modified jaw-thrust maneuver for patient with a suspected spine injury.	Provide a 10-minute break during the practice session.
	2. Each student should practice mouth-to-mouth and mouth-to-nose resuscitation of an adult manikin with and without a spine injury using the following steps:	Follow latest Heart Association procedures. Include conscious and unconscious adult procedures.
	a. Establishing unresponsiveness.	
	b. Opening airway; establishing breathlessness.	
	c. Ventilating lungs; if unsuccessful, repositioning head and reventilating.	
	d. Checking for foreign material.	
	e. Dislodging obstructions (by alternating blows and manual thrusts); checking for foreign material.	
	f. Ventilating lungs.	

Time (Elapsed) Actual	Contents	Instructor Notes
	g. Repeating "e" and "f" as necessary. h. Maintaining ventilation.	
	3. Each student should practice resuscitating an infant manikin using the following steps: a. Establishing unresponsiveness. b. Opening airway; establishing breathlessness. c. Ventilating lungs. d. Checking for foreign material. e. Dislodging obstructions; checking for foreign material. f. Ventilating lungs. g. Repeating "e" and "f" as necessary. h. Maintaining ventilation. *Note:* All students not working directly on a manikin should watch students who are and should attend to the instructor's critique. *Note:* The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	Follow latest Heart Association procedures.
Summary and Questions (2:45) 0:15 (3:00)	1. Class questions or comments on the topic of the lesson. 2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on lesson objectives.

Lesson 3

Cardiac Arrest

Objectives

Provide the student with sufficient information for him to:

Describe how the circulatory system and heart function to supply the body cells with oxygen

Describe the signs of cardiac arrest

Describe the techniques of cardiopulmonary resuscitation and variations in techniques for infants and small children

Identify organs near the heart and dangers to the patient if cardiopulmonary resuscitation is not performed correctly

Describe when CPR should not be initiated and when it should be terminated

Provide the student with sufficient practice for him to:

Demonstrate on a manikin cardiopulmonary resuscitation for a witnessed and unwitnessed arrest by a lone rescuer

Demonstrate cardiopulmonary resuscitation on an infant manikin

Demonstrate on a manikin cardiopulmonary resuscitation as a member of a team performing both as a ventilator and as a compressor, including changing positions during resuscitation and transporting the manikin on a stretcher while continuing CPR.

Requirements

Equipment/material:

Adult resuscitation manikin (one for each 6 students)

Infant resuscitation manikin (one for each 6 students)

Stretcher (one for each 6 students)

Antiseptic solution and gauze pads

Suggested illustrations (chart, slide, drawing, model):

Circulatory system

Design of the heart

Chest cavity showing ribs, heart, lungs, liver, spleen

Proper location of hands on sternum

Instructors:

One for each 6 students during practice period

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Assure that all basic life support procedures conform to the latest recommendations made by your State Heart Association.
4. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.
5. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.

6. Assure that all equipment and materials required for the lesson are available.

7. Brief all instructor aides regarding their roles and responsibilities during the lesson.

8. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowlege will be accomplished in subsequent lessons.

9. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

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[1]The contents of this lesson were based on the following references:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 7 and 10.

Standards for cardiopulmonary resuscitation (CPR) and emergency cardiac care (ECC). **JAMA**, Vol 227, No. 7 (Supplement), 18 February 1974.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage** a. Design of the circulatory system and heart and how they function to provide the body cells with oxygen. b. Physical structure of the chest cavity and organs located near the heart. c. Signs of cardiac arrest. d. Technique of cardiopulmonary resuscitation. e. Complications if cardiopulmonary resuscitation is not performed correctly. 2. **Importance of oxygen.** Re-emphasis of importance of oxygen to body tissues, particularly the brain. 3. **Criticality of lesson.** As with the previous lesson, cardiac arrest represents a true emergency; therefore: a. Skills learned in this lesson are critically important. b. Correct performance of these skills may mean the difference between life and death to the patient. 4. **Lesson objectives.** At the end of the lesson, each student will be able to: a. Describe how the circulatory system and heart function to supply the body cells with oxygen. b. Describe the signs of cardiac arrest. c. Describe the techniques of cardiopulmonary resuscitation and variation in technique for infants and small children. d. Identify organs near the heart and dangers to the patient if cardiopulmonary resuscitation is not performed correctly. e. Describe when CPR should not be initiated and when it should be terminated. f. Demonstrate on a manikin cardiopulmonary resuscitation for a witnessed and unwitnessed arrest by a lone rescuer. g. Demonstrate cardiopulmonary resuscitation on an infant manikin. h. Demonstrate on a manikin cardiopulmonary resuscitation as a member of a team performing both as a ventilator and as a compressor, including changing positions during resuscitation and transporting the manikin on a stretcher while continuing CPR.	Review lesson coverage and objectives. Emphasize criticality of skills and knowledge covered. Refer to lesson objectives in the Student Study Guide and review with class.
The Circulatory System (0:10) 0:05	1. The circulatory system consists of the heart and a series of tubes that carry blood throughout the body. 2. The tubes include:	Refer to illustration of circulatory system. Describe design and function of system elements.

Time (Elapsed) Actual	Contents	Instructor Notes
	a. ***Arteries*** that carry blood rich in oxygen and other materials **to** other body cells. b. ***Veins*** that carry deoxygenated blood and waste products **from** the body cells. c. ***Capillaries*** through which oxygenated and deoxygenated blood are exchanged with the body cells. 3. In combination with the respiratory system, the circulatory system serves to provide the body with the oxygen needed for life.	
The Heart (0:15) 0:10	1. **Design of the heart** a. The heart is a muscular organ approximately the size of a man's clenched fist. b. A wall (septum) divides the heart into an upper chamber (atrium) and a lower chamber (ventricle).	Refer to illustration of design of the heart.
	2. **The heart as a pump** a. The heart is a two-sided pump. b. The left side of the heart receives oxygenated blood from the lungs and pumps it out to all body parts through a system of arteries. c. The right side of the heart receives from the veins blood that has circulated through the body and pumps it to the lungs to be re-oxygenated. d. A system of one-way valves keeps blood moving in the proper direction and prevents backflow of the blood.	
	3. **Location** a. The heart is located in the chest cavity under the sternum and between the lungs. Pressure on the sternum will compress the heart and produce an artificial circulation. b. The liver and spleen are located below the heart—the liver to the right and center and the spleen to the left. c. Laceration of the lungs, liver or spleen could prove fatal to the patient—the first due to associated breathing difficulties and the others due to severe bleeding since they both have a large blood supply. It is therefore especially critical that the skill learned in this lesson be learned correctly.	Refer to illustration of chest cavity showing ribs, heart, lungs, liver, spleen.
Signs of Cardiac Arrest (0:25) 0:05	1. The patient is not breathing. 2. The patient has no carotid pulse.	Ask a member of the class to give the signs of respiratory arrest. Have each class member find his own carotid pulse and that of another student.

Time (Elapsed) Actual	Contents	Instructor Notes
Technique of Cardiopulmonary Resuscitation (0:30) 0:60	1. **General procedures**	Include a 10-minute break in this section after approximately 1 hr.
	a. ***Firm surface.*** Place patient on a firm surface, such as the ground or a spine board; CPR cannot be performed with the patient in a sitting position. Elevation of the lower extremities, while keeping the rest of the body horizontal, may promote venous return and aid circulation of the blood during CPR.	
	b. ***Ventilation.*** Adequately ventilate the lungs with oxygen since compression without ventilation is useless.	
	c. ***Location of hands.*** Locate the hands on the lower half of the sternum avoiding the xyphoid process (the lowest 1 to 1½ inches).	Refer to illustration of location of hands on sternum. Demonstrate position on manikin.
	d. ***Positioning of hands.*** Place the heel of one hand on top of the other, with fingers raised so that no contact is made with the ribs.	
	e. ***Positioning of body.*** Lean over the patient with your elbows straight so that the weight of your body is assisting in compression of the sternum.	Demonstrate on a manikin.
	f. ***Amount of compression.*** For an adult, compress the sternum about 1½ to 2 inches vertically downward.	Demonstrate on a manikin.
	g. ***Rate of compression.*** Compress the sternum approximately 60 to 80 times per minute in a rhythmic fashion.	Demonstrate on a manikin.
	2. **One-man technique**	Demonstrate on a manikin. Follow latest Heart Association procedures.
	a. ***Airway.*** Assure an open airway.	
	b. ***Ventilation.*** Ventilate the lungs quickly 4 times.	
	c. ***Compression.*** Perform 15 compressions of the sternum at the rate of 80 per minute.	
	d. ***Alternations.*** Alternate 15 compressions with 2 quick and full ventilations.	
	3. **Two-man technique**	
	a. ***Airway.*** Ventilator assures an open airway. 4 times.	Demonstrate on a manikin. Use class member or assistant instructor as second rescuer. Follow latest Heart Association procedures.
	b. ***Ventilation.*** Ventilator ventilates the lungs quickly 4 times.	
	c. ***Compression.*** Second rescuer performs 5 compressions of the sternum at the rate of 60 per minute. Counting "one thousand and one," "one thousand and two," "one thousand and three," will aid the rescuer in maintaining a rate of one compression per second.	
	d. ***Alternations.*** Ventilator imposes one breath after each 5 compressions.	
	e. ***Changing positions.*** Ventilator and compressor effect a smooth change in positions during resuscitation.	Describe and demonstrate system for effecting a smooth change in positions.
	4. **Infants and children**	
	a. For small children, only the heel of one hand is used and the compression should be ¾ to 1½ inches.	Demonstrate on an infant resuscitation manikin. Follow latest Heart Association procedures.
	b. For infants, only the tips of the index and middle fingers are used and the compression should be ½ to ¾ inch.	

Time (Elapsed) Actual	Contents	Instructor Notes
	c. The compression rate should be 80-100 per minute.	
	d. Pressure should be exerted over the mid-sternum.	
	e. Additional support beneath the back will be required for infants and small children since a backward tilt of the head lifts the back. This can be provided by the rescuer's hand or a folded blanket.	
	5. **Signs of effective CPR**	
	a. A carotid pulse can be felt (when working as a team, the ventilator should feel a pulse with each compression).	
	b. Pupils constrict when exposed to light.	
	c. Skin color improves.	
	d. There may be spontaneous gasping respirations.	
	e. There may be spontaneous movement of the patient's arms or legs.	
	f. The heart may resume normal beating.	
	Note: CPR produces a pumping activity that is only 25% to 33% as effective as the action of a normal heart. Thus oxygen should be delivered to all patients who have sustained a cardiac arrest as soon as it is available.	
	6. **CPR interruption.** CPR should not be interrupted for more than 5 seconds unless it is necessary to move a patient up and down a stairway. Such interruptions should not exceed 15 seconds.	
	7. **Witnessed cardiac arrest**	Follow latest Heart Association recommendations.
	a. If the rescuer witnesses a cardiac arrest, the heart may still be oxygenated and respond to a precordial thump.	
	b. To deliver a precordial thump, the rescuer should raise the fist 8 to 12 inches from the chest and deliver a sharp, quick **single** blow to the mid-sternum hitting with the bottom, fleshy portion of the fist.	Demonstrate on a manikin.
	c. The thump should be followed by 4 quick ventilations. If a pulse is not detected, standard CPR techniques should be initiated.	
	8. **Complications**	Refer to illustration of chest cavity showing ribs, heart, lungs, liver, spleen.
	a. Review of the structure of the chest cavity and location of organs proximal to the heart.	
	b. Emphasis of the importance of correct performance of the technique and dangers to the patient if it is not performed correctly, that is:	
	1) Broken ribs	
	2) Broken sternum	
	3) Lacerations of the liver, spleen, lungs or heart	
	4) Damage to the pleura resulting from broken ribs	
	9. **Beginning and terminating CPR**	
	a. CPR is not indicated for a patient known to be in the terminal stages of an incurable condition.	

Time (Elapsed) Actual	Contents	Instructor Notes
	b. Once started, CPR should be terminated only when one of the following occurs: 1) The patient's heart resumes normal beating. 2) A physician or other properly trained person responsible for emergency medical services assumes responsibility for the patient. 3) The rescuer is exhausted and unable to continue.	
Practice (groups of no more than 6 students per manikin) (1:30) 1:15	1. Each student should practice one-man cardiopulmonary resuscitation on an adult manikin using the following steps: a. Establishing unresponsiveness b. Opening airway; establishing breathlessness c. Ventilating the lungs d. Establishing pulselessness e. Performing one-man CPR *Note:* The instructor should require one or more students in each group to clear the airway and remove an obstruction from the airway.	Divide class into groups of 6. Monitor and critique each student. Permit students to practice until they can perform each step without error. Follow latest Heart Association procedures.
	2. Each student should practice one-man cardiopulmonary resuscitation on an infant manikin using the following steps: a. Establishing unresponsiveness b. Opening airway; establishing breathlessness c. Ventilating the lungs d. Establishing pulselessness e. Performing CPR	Provide a 10-minute break during the practice session.
	3. Each student should practice two-man cardiopulmonary resuscitation on an adult manikin using the following steps: a. Establishing unresponsiveness b. Opening airway; establishing breathlessness c. Ventilating the lungs d. Establishing pulselessness e. Performing two-man CPR f. Changing positions	
	4. Each student should practice two-man cardiopulmonary resuscitation on an adult manikin positioned on a moving stretcher using the steps listed in 3, above. *Note:* All students not working directly on a manikin should watch students who are and should attend to the instructor's critique. *Note:* The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	

Time (Elapsed) Actual	Contents	Instructor Notes
Summary and Questions (2:45) 0:15 (3:00)	1. Class questions or comments on the topic of the lesson. 2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on selected objectives.

Lesson 4

Mechanical Aids to Breathing and Resuscitation

Objectives

Provide the student with sufficient information for him to describe the purpose, design requirements, aseptic procedures and use (on adults, children, infants and laryngectomees as appropriate), assemble as appropriate and demonstrate uses on a manikin of the following equipment:

Oropharyngeal airways

Nasopharyngeal airways

Portable suction unit

Oxygen equipment (including cylinders, pressure regulator, flowmeter and humidifier)

Oxygen delivery system—nasal cannula, facemask, mask and bag, and/or venturi mask

Resuscitator and oxygen delivery system—pocket mask with oxygen inlet valve, bag-valve-mask resuscitator and demand valve resuscitator

Provide the student with sufficient practice for him to demonstrate on a manikin one- and two-man CPR and simultaneous administration of oxygen using the following equipment:

Pocket mask with oxygen inlet valve

Bag-valve-mask resuscitator

Note: The course coordinator and instructor should be alert to new equipment developments in this area and include all appropriate equipments in this lesson. Obviously, equipments not in use should be eliminated.

Requirements

Equipment/material:

Adult resuscitation manikin (one for each 6 students)

Infant resuscitation manikin (one for each 6 students)

Oropharyngeal airways (one set for each 6 students)

Nasopharyngeal airways (one set for each 6 students)

Portable suction unit (one for each 6 students)

Oxygen equipment (including cylinder, pressure regulator, flowmeter and humidifier) (one for each 6 students)

Nasal cannula (one for each 6 students)

Facemasks (one set for each 6 students)

Mask and bag (one set for each 6 students)

Venturi mask (one set for each 6 students)

Pocket mask with oxygen inlet valve (one set for each 6 students)

Bag-valve-mask system (one set for each 6 students)

Demand-valve resuscitator (one for each 6 students)

Lubricant jelly

Antiseptic solution and gauze pads

Note: when appropriate, adult, child and infant sizes of equipment should be available.

Note: IPPB units are not recommended for use during CPR and are therefore not covered in the lesson.

Suggested illustrations (chart, slide, drawing, model):

Properly inserted oropharyngeal airway

Properly inserted nasopharyngeal airway

Instructors:

One for each 6 students during practice period

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outline as appropriate when you deliver your lecture.
4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.
5. Assure that all equipment and materials required for the lesson are available.
6. Brief all instructor aides regarding their roles and responsibilities during the lesson.
7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.
8. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

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[1]The contents of this lesson were based on the following references:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 10 and 11.

Standards for cardiopulmonary resuscitation (CPR) and emergency cardiac care (ECC). **JAMA**, Vol. 227, No. 7 (Supplement), 18 February 1974.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage.** Purpose, design features and procedures for using the following equipment: a. Oropharyngeal airways b. Nasopharyngeal airways c. Portable suction equipment d. Oxygen equipment e. Oxygen delivery systems 1) Nasal cannula 2) Facemask 3) Mask and bag 4) Venturi mask f. Oxygen and ventilation systems 1) Mouth-to-mask system 2) Bag-valve-mask system 3) Demand-valve system	Review lesson coverage and objectives. Display each piece of equipment as it is mentioned.
	2. **Importance of lesson** a. A person can be given basic life support without the use of mechanical aids. b. In many cases, however, mechanical aids make airway care and ventilation easier and more effective. c. If oxygen is required, mechanical aids are a necessity. d. Oxygen is an important aid to any patient with a breathing difficulty.	
	4. **Lesson objectives.** At the end of the lesson, each student will be able to: a. Describe the purpose, design requirements, aseptic procedures and use (on adults, children, infants and laryngectomees as appropriate, and demonstrate use of the following equipment: 1) Oropharyngeal airways 2) Nasopharyngeal airways 3) Portable suction unit 4) Oxygen equipment 5) Oxygen delivery system—nasal cannula, facemask mask and bag, and/or venturi mask 6) Resuscitator and oxygen delivery system—pocket mask with oxygen inlet valve, bag-valve-mask resuscitator and demand-valve resuscitator b. Demonstrate on a manikin one- and two-man CPR and simultaneous administration of oxygen using the following equipment: 1) Pocket mask with oxygen inlet valve 2) Bag-valve-mask resuscitator	Refer to lesson objectives in the Student Study Guide and review with class.

Time (Elapsed) Actual	Contents	Instructor Notes
Oropharyngeal Airways (0:10) 0:05	1. **Purpose**	
	a. Oropharyngeal airways can be used to maintain an open airway on deeply unconscious patients.	Display adult, child and infant sizes.
	b. They should not be used on stuperous or conscious patients since they may cause vomiting or spasm of the vocal cords.	Explain conditon and seriousness of vocal chord spasm.
	2. **Use**	
	a. Care is required in inserting the airway since it can force the tongue back into the pharynx and cause an obstruction.	Refer to illustration of properly inserted oropharyngeal airway.
	b. Procedures of inserting the airway are as follows:	Demonstrate airway insertion on a manikin. Describe aseptic procedures.
	1) Open the patient's mouth using the cross-finger technique.	
	2) Insert the airway with the tip facing upward (toward the roof of the patient's mouth).	
	3) When halfway in, rotate it 180° and insert it until the flange rests on the lips or teeth (the curve of the airway follows the patient's tongue).	
	Note: Use of a tongue blade to depress the tongue will ease correct insertion of the airway.	
Nasopharyngeal Airways (0:15) 0:05	1. **Purpose.** A nasopharyngeal airway will not stimulate vomiting and may be used on a conscious patient who cannot maintain an open airway.	Display nasopharyngeal airways. Describe aseptic procedures.
	2. **Use**	
	a. Lubricate the airway.	Refer to illustration of properly inserted nasopharyngeal airway.
	b. Insert it through a nostril until the flange rests against the nostril.	
Suction Unit (0:20) 0:05	1. **Purpose.** A suction unit permits removal of blood and other liquid materials from the airway.	Display suction unit.
	2. **Design requirements—portable unit**	
	a. The unit should be fitted with a wide-bore, thick-wall, non-kinking tubing and semi-rigid suction tips.	Refer to each component.
	b. Multiple sterile, disposable suction catheters of various sizes should permit suctioning of mouth, pharynx and stoma.	
	c. Rigid pharyngeal suction tips (tonsil suction tips) are best for suctioning the pharynx but may induce vomiting in awake or semi-awake persons.	
	d. The collection bottle should be non-breakable, and a supply of water should be available for rinsing tubes and catheters.	
	e. The vacuum pressure and flow should be adequate for pharyngeal suction.	
	3. **Use**	Demonstrate use of equipment and suction pro-
	a. Inspect unit to insure that all parts are assembled.	

Time (Elapsed) Actual	Contents	Instructor Notes
		cedures on manikin. Describe aseptic procedures.
	b. Switch on suction, clamp tubing and assure that pressure dial registers over 300 mm Hg.	Reduce pressure for children.
	c. Attach flexible catheter or rigid tonsil sucker.	
	d. Open the mouth with the cross-finger technique.	
	e. Insert the catheter into the pharynx—length of insertion is distance from mouth to lobe of ear. Insert rigid tonsil sucker with convex side along the the roof of the mouth until the pharynx is reached.	Demonstrate determining distance of insertion on manikin.
	f. Apply suctioning only after catheter is in position—suctioning should not exceed 15 seconds.	
Oxygen (0:25) 0:15	1. **Patients needing oxygen**	
	a. ***Patients suffering a cardiac arrest***	
	1) As indicated previously, CPR produces a pumping activity that is only 25% to 33% as effective as the action of a normal heart; thus, oxygen delivery to the blood is impaired.	
	2) The patient receiving CPR is therefore oxygen-deficient and should receive oxygen of 100% concentration as soon as it is available.	
	b. ***Other patients.*** Several medical and physical conditions result in hypoxia in which there is an inadequate amount of oxygen available to meet the body's needs. These medical conditions will be discussed in subsequent lessons. In general, most patients with respiratory or circulatory difficulties will benefit from supplemental oxygen.	Give examples.
	2. **Dangers**	
	a. Oxygen supports combustion.	Discuss safe practice relative to use of oxygen.
	b. In some chronic disease states like emphysema, administration of oxygen can decrease respiration since, in these patients, a low blood oxygen level is the stimulus for respiration.	Identify normal stimulus for respiration.
	3. **Oxygen equipment**	
	a. ***Cylinders***	
	1) Oxygen is usually supplied as a compressed gas in seamless steel cylinders.	Display oxygen cylinder.
	2) Cylinders of E size and smaller have outlet valves designed to accept pressure-reducing gauges of the yoke type which have a pin-indexing safety attachment system.	Display and describe indexing systems for available oxygen equipment.
	3) Cylinders larger than E size are equipped with threaded gas-outlet valves which will not accept a regulator valve unless it fits the specific outlet.	
	4) Thus the cylinders are designed so that an oxygen line or regulator cannot mistakenly be attached to a cylinder of another compressed gas.	
	5) Compressed cylinders must be handled carefully since their contents are under pressure.	

Time (Elapsed) Actual	Contents	Instructor Notes
	b. ***Pressure regulators and flowmeters***	Display and describe pressure regulator, flowmeter, and humidifier.
	1) Pressure of a full oxygen cylinder will be 2000 to 2200 psi; it must be reduced to 40 to 70 psi before administration to a patient.	
	2) Flowmeters are typically permanently attached to the pressure regulator; they permit oxygen to be delivered to the patient at the desired rate.	
	3) Since oxygen in a compressed cylinder is an extremely dry gas, a humidifier should be attached to the flowmeter to prevent excessive dryness of the patient's mucous membranes if prolonged administration of oxygen is anticipated.	
	c. ***Operating procedures.*** The EMT should:	Demonstrate procedures.
	1) Remove protective cap.	
	2) "Crack" the valve.	
	3) Attach regulator-flowmeter.	
	4) Attach humidifier.	
	5) Reduce the pressure.	
	6) Regulate the flow.	
	7) Connect administering apparatus.	
	8) Shut down the apparatus.	
Equipment for Oxygen Delivery (0:40) 0:10	1. **Nasal cannula**	Display equipment and demonstrate use on manikin. Describe aseptic procedures.
	a. If the flowmeter is set between 5 and 8 liters per minute, oxygen concentrations in inspired air can range from 35 to 50%.	
	b. A mouth breather or person with a nasal obstruction derives minimal benefit from this method of oxygen administration.	
	2. **Facemask.** With flowrates of 6 to 10 liters per minute, oxygen concentrations of 35 to 60% can be obtained in inspired air. Infant size mask should be used on a stoma.	Display equipment and demonstrate use on manikin. Describe aseptic procedures.
	3. **Mask and bag**	
	a. Gas inflow must be set at whatever level will prevent complete collapse of the bag.	
	b. Oxygen concentrations in excess of 60% in inspired air can be obtained with this system.	
	4. **Venturi masks.** They are designed to deliver specific concentrations of inspired oxygen of either 24, 28, 35 or 40%.	Display equipment and demonstrate use on manikin. Describe aseptic procedures.
Ten-Minute Break (0:50) 0:10		

Time (Elapsed) Actual	Contents	Instructor Notes
Equipment for Ventilation and Oxygen Delivery (1:00) 0:30	1. **Pocket-mask with oxygen inlet valve (mouth-to-mask system)** a. ***Purpose*** 1) This is a ventilation system which permits additional oxygen to be delivered to the patient. 2) Five liters of oxygen per minute will provide the the patient with approximately 50% oxygen; 15 liters per minute, with approximately 55% oxygen. b. ***Use*** 1) Stand behind patient's head and open airway with a backward tilt. 2) Apply mask to the face with the apex over the bridge of the nose and the base between the lips and chin. 3) Place thumbs on dome of mask and hold patient's mandible with remaining fingers. 4) Maintain an airtight seal with firm pressure between thumb and fingers. 5) Maintain an open airway by an upward and forward pull of fingers behind the jaw. 6) Breathe through open port in chimney. 7) Remove mouth and allow patient to exhale passively. *Note:* Infant size mask can be used on the stoma.	Display equipment and demonstrate use on a manikin. Describe aseptic procedures.
	2. **Bag-valve-mask resuscitator** a. ***Purpose*** 1) This system permits delivery of high concentrations of oxygen and patient ventilation at the same time. 2) It will deliver more than 90% oxygen. 3) It should be used with an oropharyngeal airway in place. b. ***Design requirements*** 1) The bag should be self-refilling without sponge rubber. 2) It should contain a non-jam valve system calibrated at 15 liters per minute oxygen-inlet flow, which cannot be incorrectly reassembled. 3) The facemask should be transparent plastic with an air-filled or contoured resilient cuff. 4) It should contain a no-pop-off valve except for pediatric models. 5) Fittings should be standard 15 mm/22 mm. 6) The valve should be non-rebreathing. 7) It should have an ancillary oxygen inlet. 8) It should operate in cold weather. c. ***Use*** 1) Select correct mask size. 2) Inflate collar if necessary. 3) Open airway with cross-finger technique and insert oropharyngeal airway.	Display equipment, describe design requirements and demonstrate use on a manikin. Describe aseptic procedures.

Time (Elapsed) Actual	Contents	Instructor Notes
	4) Apply mask over the patient's face with its apex over the bridge of the nose and its base between the lower lip and chin. 5) Hold the mask firmly in position by placing three fingers of one hand on the mandible between the angle and the lobe of the ear while the index finger is held over the lower portion of the mask and the thumb over the upper portion of the mask. 6) With the other hand, compress the bag in a rhythmical manner once every five seconds. d. ***Comments on use*** 1) Better volumes for ventilation can be delivered by direct mouth-to-mouth resuscitation but supplemental oxygen cannot be provided. 2) Better volumes for ventilation can be delivered by the mouth-to-mask system but the latter delivers only 55% oxygen in contrast to more than 90% for the bag-valve-mask system.	
	3. **Demand-valve resuscitator** a. ***Purpose*** 1) This system can be used to assist ventilation or control it. 2) It can deliver 100% oxygen. b. ***Design requirements*** 1) Valve can open in response to patient's inspiratory effort or by manual control of EMT. 2) Demand-valve units in ambulances must be equipped with manual control. 3) Valves will operate effectively in a supply-pressure range of 40 to 80 psi. c. ***Use*** 1) Preset pressure initially at 10 to 20 cm H_2O or 8 to 15 mm Hg. Increase as necessary during use. 2) Apply mask. Assure an airtight fit between patient's face and mask. 3) Ventilate patient by periodically depressing valve button. Monitor manual control at all times.	Display equipment, describe design requirements and demonstrate use on a manikin. Describe aseptic procedures.
Practice (Groups of no more than 6 students per manikin) (1:30) 1:15	1. Each student should practice the following skills on adult and infant manikins: a. Inserting oropharyngeal airways. b. Inserting nasopharyngeal airways c. Setting up, using and closing down suction devices. d. Setting up, administering and closing down oxygen equipment. Administration should be by all available equipment, that is, nasal cannula, facemask, mask and bag and/or venturi mask. 2. Each student should perform on an adult manikin one- and two-man CPR and simultaneous administration of oxygen using the pocket mask with oxygen inlet valve and the bag-valve-mask resuscitator.	Divide class into groups of of 6. Monitor and critique each student. Permit students to practice until they can perform each step without error. Provide a 10-minute break during the practice session.

Time (Elapsed) Actual	Contents	Instructor Notes
	Note: All students not working directly with the equipment should watch students who are and should attend to the instructor's critique. *Note:* The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for student to achieve the lesson objectives.	
Summary and Questions (2:45) 0:15 (3:00)	1. Class questions or comments on the topic of the lesson. 2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on selected objectives.

Lesson 5

Bleeding, Shock and Practice on Airway Care, Pulmonary Resuscitation and Cardiopulmonary Resuscitation

Objectives

Provide the student with sufficient information for him to:

Describe the design, functions and components of the circulatory system

Describe the meaning and importance of blood pressure as a vital sign

Describe the meaning of shock, signs of shock and emergency care for shock

Identify the types of shock and their causes

Describe the differences between arterial, venous and capillary bleeding

Identify and describe means of controlling external bleeding including nosebleeds

Describe the signs, symptoms and emergency care for internal bleeding

Provide the student with sufficient practice for him to:

Perform an examination for life-threatening problems

Take blood pressure measurements

Apply a tourniquet

Permit the student to practice as needed any skills taught in Lessons 2, 3, and 4, specifically:

Airway care

Pulmonary resuscitation

Cardiopulmonary resuscitation

Use of mechanical aids to airway care and resuscitation

Requirements

Equipment/material:

Adult resuscitation manikin (one for each 6 students)

Infant resuscitation manikin (one for each 6 students)

Oropharyngeal airways (one set for each 6 students)

Nasopharyngeal airways (one set for each 6 students)

Portable suction unit (one for each 6 students)

Oxygen equipment (including cylinder, pressure regulator, flowmeter and humidifier) (one for each 6 students)

Nasal cannula (one for each 6 students)

Facemasks (one set for each 6 students)

Mask and bag (one set for each 6 students)

Venturi mask (one set for each 6 students)

Pocket mask with oxygen inlet valve (one set for each 6 students)

Bag-valve-mask system (one set for each 6 students)

Sphygmomanometer and stethoscope (one set for each 6 students)

Pressure dressing and bandage

Tourniquet and bandages (one set for each 6 students)

Stretcher (one for each 6 students)

Lubricant jelly

Antiseptic solution and gauze pads

Note: Where appropriate, adult, child and infant sizes of equipment should be available.

Suggested illustrations (chart, slide, drawing):

Design of heart

Circulatory system

Face of patient in shock

Instructors:

One for each 6 students during practice period.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Review outlines and references for Lessons 2, 3 and 4 to assure correct procedures for demonstrations of skills during the practice periods.
4. Use the references and your own knowledge and experience to enrich the lesson outline as appropriate when you deliver your lecture.
5. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.
6. Assure that all equipment and materials required for the lesson are available.
7. Brief all instructor aides regarding their roles and responsibilities during the lesson.
8. Before completing the lesson, make sure that all students can perform the skills as specified—interim evaluation of both skills and knowledge will be accomplished in the next lesson.
9. If the course coordinator determines that a review of previous lesson is required, additional time will need to be added to this lesson for such a review.

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[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 4, 7, 8 and 9.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage** a. The design of the circulatory system. b. Technique of determining blood pressure. c. Signs and meaning of shock and techniques for preventing shock. d. Signs of external and internal bleeding and techniques for controlling bleeding. e. Performing an examination for life-threatening problems. f. Additional practice on airway care, pulmonary resuscitation and cardiopulmonary resuscitation.	Review lesson coverage and objectives. Emphasize criticality of skills and knowledge covered.
	2. **Need for lesson** a. Severe bleeding and shock are life-threatening emergencies. Performing a patient survey for life-threatening problems will be the EMT's first responsibility at the accident scene. b. Students will be evaluated on knowledges and skills in the next lesson. The practice session for this lesson will therefore provide an opportunity for all students to practice skills learned thus far in the course in order that they may be prepared for the practice, test and evaluation session.	Emphasize importance of the practice session.
	3. **Lesson objectives.** At the end of the lesson, each student will be able to: a. Describe the design, functions and components of the circulatory system. b. Describe the meaning and importance of blood pressure as a vital sign. c. Describe the meaning of shock, signs of shock, and emergency care for shock. d. Identify the types of shock and their causes. e. Describe the differences between arterial, venous and capillary bleeding. f. Identify and describe means of controlling external bleeding including nosebleeds. g. Describe the signs, symptoms and emergency care for internal bleeding. h. Take blood pressure measurements. i. Apply a tourniquet. j. Perform an examination for life-threatening problems.	Refer to lesson objectives in the Student Study Guide and review with class.

Time (Elapsed) Actual	Contents	Instructor Notes
	k. Practice as needed any skills taught in Lessons 2, 3, 4, specifically: 1) Airway care. 2) Pulmonary resuscitation. 3) Cardiopulmonary resuscitation. 4) Use of mechanical aids to airway care and resuscitation.	
Mechanics of Circulation (0:10) 0:15	1. **System elements and functions** a. ***Heart.*** The heart is a hollow muscular organ. 1) The left part of the heart receives oxygenated blood from the lungs and pumps it to all body parts. 2) The right part of the heart receives blood from all body parts and pumps it to the lungs to be reoxygenated. b. ***Arteries.*** Arteries carry freshly oxygenated blood to the body. The aorta is the major artery leaving the left side of the heart. c. ***Capillaries.*** Each artery divides into smaller and smaller branches and finally forms capillaries. Through the very thin capillary walls, oxygen, carbon dioxide and other substances are exchanged between body cells and the circulatory system. d. ***Veins.*** Veins collect deoxygenated blood from the capillaries and carry it back to the heart.	Refer to illustrations of: Design of heart Circulatory system
	2. **Pulse.** Each time the heart pumps, a pulse can be felt throughout the arterial system. The pulse can be felt in any area where an artery passes over a bony prominence or lies close to the skin. It can most easily be felt where a large artery is close to the skin surface, that is: a. The radial pulse. b. The carotid pulse. c. The femoral pulse.	Demonstrate location of pulses and have each class member find his own pulses and those of a neighbor.
	3. **Blood** a. ***Composition.*** Blood is a red, sticky fluid that travels through the circulatory system. The normal adult has six liters of blood. b. ***Functions*** 1) Blood carries oxygen to body tissues and removes waste products. 2) It carries cells that combat infection in the body. 3) It has a capability of clotting; clotting normally takes 6 to 7 minutes.	
	c. ***Perfusion*** 1) The term perfusion means the circulation of blood within an organ. An organ is perfused if blood is entering it through the arteries and leaving through the veins.	Explain how perfusion keeps body cells healthy.

Time (Elapsed) Actual	Contents	Instructor Notes
	2) Perfusion keeps the body cells healthy by providing them with oxygen and other nutrients and removing waste products.	
	4. **Blood pressure**	
	a. ***Definition***	
	1) Blood pressure is the pressure that the blood exerts against the walls of the arteries as it passes through them.	
	2) The pressure wave has high and low points, called systolic pressure and diastolic pressure.	Draw pressure wave on chalkboard.
	3) They can be measured by a sphygmomanometer and are expressed numerically in millimeters of mercury.	
	4) In normal males, systolic pressure varies from 100 mm Hg plus the age of the patient up to 140-150 mm Hg; diastolic pressure, from 65 to 90 mm Hg. In females, the pressure may be 8 to 10 mm Hg lower.	
	5) Abnormally high blood pressure may result in rupture of the arteries. Abnormally low blood pressure means that there is insufficient pressure in the system to supply blood to all organs of the body and some of these organs may die.	
	6) It is important for a physician to know the patient's blood pressure as soon as possible after an emergency event in order for him to evaluate the significance of any change in blood pressure measured at the hospital.	
	b. ***Measurement.*** Blood pressure is measured with a sphygmomanometer. Procedures are:	Display equipment and demonstrate technique on a student. Explain that cuff should be snug.
	1) Fasten cuff of sphygmomanometer about either arm above the elbow and inflate with the rubber bulb until the mercury column or the needle of the dial stops moving with the pulse (usually between 150 and 200 mm Hg).	
	2) Place the stethoscope diaphragm or bell over the brachial artery.	Have each student locate his own brachial artery and that of his neighbor.
	3) Release air slowly from the bulb and observe the mercury column fall or aneroid dial return to zero.	
	4) Record as the systolic pressure the point on the gauge at which the sound of the pulse is first heard.	
	5) Record as the diastolic pressure the level on the [illegible]e at which the sounds disappear.	Demonstrate obtaining systolic reading by palpation.
Shock (0:25) 0:25	1. **Meaning.** Shock is a failure of the circulatory system to provide sufficient circulation to every body part. Perfusion of organ systems fails.	Describe susceptibility of different organs to lack of perfusion.
	2. **Causes.** Shock is caused by:	
	a. Failure of the heart to pump sufficient blood.	
	b. Severe blood or fluid loss so that there is insufficient blood traveling through the system.	

Time (Elapsed) Actual	Contents	Instructor Notes
	c. Enlargement of blood vessels so that there is insufficient blood to fill them.	
	d. Breathing problems resulting in insufficient oxygen traveling through the system.	
	3. **Result.** Result is the same in all cases—all normal bodily processes are affected.	
	4. **Types**	List types on chalkboard as they are mentioned. Give examples of causes of each type.
	a. ***Hemorrhagic (hypovolemic) shock (blood loss)***—there is insufficient blood in the system to provide adequate circulation to all body organs.	
	b. ***Respiratory shock (inadequate breathing)***—there is an insufficient amount of oxygen in the blood.	
	c. ***Neurogenic shock (loss of vascular control by the nervous system)***—blood vessels dilate and there is insufficient blood to fill them.	
	d. ***Psychogenic shock (fainting)***—temporary dilation of the blood vessels results in decreased blood supply to the brain.	
	e. ***Cardiogenic shock (inadequate functioning of the heart)***—the heart muscle no longer imparts sufficient pressure to the blood to drive it through the system.	
	f. ***Septic shock (severe infection)***—bacteria attack small blood vessel walls so that they lose blood and plasma and can no longer constrict.	
	g. ***Anaphylactic shock (allergic reaction)***—this is a severe allergic reaction caused by foods, drugs, insect stings and inhaled substances. It can occur in minutes or even seconds following contact with the substance to which the patient is allergic.	
	h. ***Metabolic shock (bodily loss of fluid)***—a severe fluid loss occurs from a severe untreated illness.	
	5. **Signs and symptoms**	Refer to illustration of face of patient in shock.
	a. Restlessness and anxiety (these signs may precede all others).	
	b. Weak and rapid (thready) pulse.	
	c. Cold and clammy skin.	
	d. Profuse sweating.	
	e. Pale or cyanotic face.	
	f. Breathing shallow, labored, rapid, possibly irregular or gasping.	
	g. Eyes dull or lusterless with dilated pupils.	
	h. Marked thirst.	
	i. Possible nausea or vomiting.	
	j. Gradual and steady drop in blood pressure.	
	k. Possible fainting in cases of rapidly developing transient shock.	
	6. **Signs and symptoms—anaphylactic shock**	
	a. The skin may burn, flush, itch or break out. The	

Time (Elapsed) Actual	Contents	Instructor Notes
	face and tongue may swell. Cyanosis may be visible around the lips.	
	b. Breathing is difficult. There is a tightness or pain in the chest and persistent coughing.	
	c. Blood pressure drops and the pulse becomes weak or imperceptible.	
	d. Faintness and coma may ensue.	
	7. **Emergency care.** Certain principles of initial treatment may be applied to all patients in shock.	
	a. Secure a clear airway and administer oxygen.	Relate the type of care to the type of shock.
	b. Control bleeding.	
	c. Elevate lower extremities if injuries to them do not make this inadvisable.	
	d. Splint fractures.	
	e. Avoid rough handling.	
	f. Prevent **loss** of body heat.	
	g. Keep the patient supine unless he is personally more comfortable in another positon.	
	h. Record blood pressure, pulse and other vital signs at 5-minute intervals.	
	i. Do not feed the patient or give him anything to drink.	
	Note: The basic care for shock is to care for the whole patient to **prevent** shock.	
	Note: The only effective treatment for anaphylactic shock is an injection to combat the agent causing the reaction. The patient needs prompt transportation to a medical facility.	
	8. **Intravenous fluid administration**	
	a. IV's are required for any type of shock in which there is an insufficient volume of fluid traveling in the circulatory system. This occurs specifically with hemorrhagic, neurogenic, septic and metabolic shock.	Review local procedures regarding IV administration and maintenance by an EMT.
	b. Infusion of a salt or sugar solution expands the blood volume and permits perfusion of all body organs.	
	c. Intravenous fluid administration must be ordered by a physician.	
	d. The EMT will probably first be exposed to IV therapy by being trained by a physician to maintain fluid administration during transfer. The IV unit will already be connected to the patient before transportation occurs.	
Ten-Minute Break (0:50) 0:10		

Time (Elapsed) Actual	Contents	Instructor Notes
External Bleeding (1:00) 0:15	**1. Seriousness**	
	a. The loss of 1 liter of blood in an adult is serious and of 500 ml (½ liter) of blood in a child is serious.	
	b. The body has a natural mechanism of defense against bleeding, that is clotting. If damage is severe, however, clots physically cannot occlude the damaged blood vessels.	
	c. If uncontrolled, bleeding can result in shock and death.	
	2. Types	
	a. ***Artery.*** Bleeding from an artery spurts and is bright red in color because it is rich in oxygen.	
	b. ***Vein.*** Bleeding from a vein is steady and is dark bluish-red in color.	
	c. ***Capillary.*** Blood oozes from a capillary and is similar in color to venous blood.	
	3. Control of bleeding	Describe uses, advantages and disadvantages of each type. Demonstrate on a student.
	a. ***Direct pressure***	
	1) Direct pressure with the hand over the wound using a universal dressing or gauze pad will stop most bleeding.	
	2) The dressing should be held in place with a bandage.	
	3) If the bleeding does not stop, additional pressure should be applied with the hand.	
	4) Elevation may help control bleeding of an extremity.	
	b. ***Pressure points.*** If pressure dressings are not available, pressure points may be used to control severe bleeding in the arm or leg.	Explain that pressure points should be used only if direct pressure fails.
	1) The brachial artery is pressed against the bone to stop bleeding below the pressure point.	Have each student demonstrate on another student.
	2) The femoral artery is pressed against the pelvis to stop bleeding in the leg.	
	c. ***Tourniquet***	Have each student demonstrate on another student.
	1) *Use.* A tourniquet is used **only** in a severe emergency when other means will not stop bleeding in an extremity.	
	2) *Dangers.* Tourniquets can damage nerves and blood vessels and can result in the loss of an arm or leg.	Explain damages that can result from use or improper use of tourniquets.
	3) *Procedures.* If a tourniquet must be used:	Demonstrate on a student.
	a) Use a bandage 3 to 4 inches wide and 6 to 8 layers deep.	
	b) Wrap it around the extremity twice and tie a half knot.	
	c) Place a stick on top of the knot and complete tieing a square knot.	
	d) Twist the stick until the bleeding stops, and tie it in position.	
	e) Mark TK on the patient's forehead and be sure to notify other emergency personnel who take	

Time (Elapsed) Actual	Contents	Instructor Notes
	charge of the patient that a tourniquet has been applied.	
	d. ***Splints***	
	1) When a fracture is present, much damage is caused to tissues by broken bones.	
	2) Splinting may allow prompt control of bleeding associated with the injury.	
	e. ***Pressure pants and splints***	
	1) Pressure splints and pants can aid markedly in controlling severe hemorrhage when massive lacerations of muscle and tissue and multiple fractures have occured.	
	2) Pressure pants can also aid in shock control.	
	4. **Nosebleeds** (epistaxes)	
	a. *Seriousness.* Nosebleeds can be serious enough to cause shock from blood loss.	
	b. *Causes*	
	1) Fractured skull.	
	2) Facial injuries.	
	3) Sinusitis, infections, abnormalities of the inside of the nose.	
	4) High blood pressure.	
	5) Bleeding diseases.	
	c. *Emergency care.* Procedures are:	
	1) Pinch the nostrils or place a bandage between the upper lip and the gum and press.	Explain reasons for the techniques of care.
	2) Keep patient in sitting position.	
	3) Keep patient quiet.	
	4) If available, apply ice over the nose.	
	5) *Caution.* Bleeding from the nose or ears may mean there is a skull fracture. This type of bleeding should not be stopped.	Give reason.
Internal Bleeding (1:15) 0:10	1. **Seriousness**	
	a. Internal bleeding can result in severe blood loss and the patient may die of shock.	
	b. As an example, a fractured shaft of the femur can result in an internal loss of 1 liter of blood.	
	c. Laceration of the liver can result in severe blood loss and be quickly fatal.	
	2. **Signs**	Ask class to identify signs of shock.
	a. The signs of internal bleeding are similar to those of shock.	
	b. In addition, the patient may cough up or vomit bright red blood, vomit dark blood (the color of coffee grounds), pass dark stools, pass bright red blood, or have a tender, rigid abdomen that enlarges.	Identify injuries associated with each sign.
	3. **Emergency care**	
	a. The patient suffering from severe internal bleeding is	

Time (Elapsed) Actual	Contents	Instructor Notes
	a serious case and the rescuer can do very little for him at the accident scene.	
	b. If bleeding is suspected in an extremity, it may be controlled by a pressure dressing or by application of a splint.	
	c. Fast transportation to a hospital is a must.	
	d. If available, oxygen should be administered.	
Primary Patient Survey (1:25) 0:15	1. **Stages.** At the emergency scene, patient examination must be performed. It is performed in two stages:	
	a. Checking for and controlling life-threatening problems—the primary survey.	
	b. Checking for and stabilizing injuries not threatening to life—the secondary survey—to be demonstrated in Lesson 8.	
	2. **Primary patient survey.** The procedures for the life-threatening survey are accomplished simultaneously not sequentially. For example, the rescuer does not check for breathing first when he notices blood severely gushing from a wound. The EMT will feel, talk and observe.	Demonstrate procedures on a student. Explain what you are doing, implications of what you find, and actions you would take. Stress importance of asking witnesses for information.
	Note: The EMT should always check for medical identifcation symbols.	
	a. ***State of consciousness***	
	1) Establish responsiveness.	Discuss implications.
	2) Check pupils.	
	b. ***Respirations***	
	1) Observe chest and feel for exhaled air at mouth and nose.	
	2) Assess rate, quantity, quality.	Discuss implications.
	3) Don't forget the special case of the laryngectomee.	
	c. ***Pulse***	
	1) Establish existence.	
	2) Assess rate and quality.	Discuss implications.
	d. ***Bleeding/shock***	
	1) Observe for life-threatening external bleeding.	
	2) Observe for indications of internal bleeding.	Discuss signs.
	Note: If there are multiple casualties, check each patient, stopping only to administer to those with life-threatening problems.	
Practice (groups of no more than 6 students per manikin or item of equipment) (1:40) 1:05	1. Each student should practice taking blood pressure of other students using the following steps:	Divide class into groups of 6. Provide a 10-minute break during the practice session.
	a. Fastening and inflating the cuff.	
	b. Placing the diaphragm or bell over the brachial artery.	
	c. Releasing air and recording systolic and diastolic pressures.	Monitor and critique each student. Permit students to practice until they can perform the skill without error.
	Note: The student should also measure systolic pressure by palpation.	

Time (Elapsed) Actual	Contents	Instructor Notes
	2. Each student should practice applying a tourniquet on a fellow student.	Do not prevent circulation in the extremity.
	3. Each student should perform an examination of a fellow student for life-threatening problems. He should describe what he is doing, implications of his finding and actions to be taken. The instructor should provide any needed information. The student's performance should include:	
	a. Checking for state of consciousness.	
	b. Checking respirations.	
	c. Checking pulse.	
	d. Checking for life-threatening bleeding and shock.	
	4. Each student should practice **as needed** the following skills (taught in Lessons 2, 3 and 4):	
	a. Opening the airway of patients with and without spine injuries.	Permit students to practice skills **they feel they need** to practice. Monitor and critique on an as-needed basis.
	b. Dislodging foreign objects from the airway by blows and by manual thrusts.	
	c. Performing pulmonary resuscitation on an adult and infant manikin.	
	d. Performing one-man cardiopulmonary resuscitation on an adult manikin for both a witnessed and unwitnessed cardiac arrest.	
	e. Performing two-man cardiopulmonary resuscitation including changing positions during resuscitation.	
	f. Performing cardiopulmonary resuscitation while manikin is being transported on a stretcher.	
	g. Performing cardiopulmonary resuscitation on an infant manikin.	
	h. Using the following equipment (including setting up and closing down equipment as appropriate):	
	1) Oropharyngeal airways.	
	2) Nasopharyngeal airways.	
	3) Portable suction unit.	
	4) Oxygen (cylinder, pressure regulator, flowmeter, humidifier).	
	5) Oxygen delivery system—nasal cannula, facemasks, mask and bag, and/or venturi mask.	
	6) Pocket mask with oxygen inlet valve.	
	7) Bag-valve-mask resuscitator with and without oxygen.	
	Note: The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	
Summary and Questions (2:45) 0:15 (3:00)	1. Class questions or comments on the topic of the lesson.	
	2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on selected objectives.
	3. Reminder that the next lesson is a practice, test and evaluation lesson.	

Lesson 6

Practice, Test and Evaluation— Airway Care, Pulmonary Arrest, Cardiac Arrest Bleeding and Shock

Objectives

Administer a written test to evaluate student attainment of the knowledge objectives specified for Lessons 1 through 5.

Permit the student to practice skills taught in Lessons 1 through 5.

Evaluate student attainment of the skill objectives specified for Lessons 1 through 5.

Requirements

Equipment/material:

Written test covering topic area (one for each student)

Checklist (one for each student for each skill included in the evaluation session)

Adult resuscitation manikin (one for each 6 students)

Infant resuscitation manikin (one for each 6 students)

Oropharyngeal airways (one set for each 6 students)

Nasopharyngeal airways (one for each 6 students)

Portable suction unit (one for each 6 students)

Oxygen equipment and delivery system (one for each 6 students)

Bag-valve-mask system (one for each 6 students)

Tourniquet and bandages (one set for each 6 students)

Sphygmomanometer and stethoscope (one set for each 6 students)

Lubricant jelly

Antiseptic solution and gauze pads

Note: When appropriate, adult, child and infant sizes of equipment should be available.

Instructors:

One for each 6 students during the evaluation session.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for this lesson.

Instructor Tasks

1. **Evaluaton of knowledge objectives**

It is assumed that instructors for individual lessons will assist the course coordinator in developing written test items for the lessons they teach. It will be the responsibility of the course coordinator to assemble a balanced test that is directed toward assessing whether or not the knowledge objectives of Lessons 1 through 5 have been achieved.

The instructor for the first part of this lesson serves largely as a monitor of the test itself. He should assure that he has sufficient copies of the test for each student and should review all procedures for completing the test so that he can explain these procedures correctly to the students.

2. **Evaluation of skill objectives**

In order to assure that all students are evaluated in the same manner, the instructor should have a checklist on which he can check off the principal features of the skill to be evaluated. This checklist essentially comprises the student's evaluation sheet. It is assumed that the checklist

will be prepared by the instructor and course coordinator. To aid in designing checklists, the lesson plan identifies certain features of each skill. They may be refined into a list of steps. The resultant steps may not be all of equal weight in skill evaluation. The primary purpose of the checklist is to aid instructors in **standardizing** their evaluations of student performance. All instructors must be briefed on checklist use.

Detailed procedures for the evaluation session are not specified since they will vary depending on the number of students in the class, the number of instructors and the amount of equipment available. It is suggested that instructors divide among themselves the skills to be evaluated. In effect, the lead instructor should set up test stations. He should also assure that all equipment and materials required for the lesson are available.

All instructors should be thoroughly briefed on their responsibilities. Each instructor should review the lesson plans and references for Lesson 1 through 5 so that they are thoroughly knowledgeable about their contents.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	
Evaluation of Knowledge Objectives (0:05) 0:30	1. Student completion of written test designed to evaluate attainment of knowledge objectives specified for Lessons 1 through 5.	Distribute test. Explain procedures for taking the test. Collect completed papers.
Ten-Minute Break (0:35) 0:10		
Practice and Evaluation of Skill Objectives (0:45) 2:15	1. **Practice.** Working singly or in groups or two, each student should be permitted to practice each skill until he feels prepared to be evaluated on that skill. 2. **Evaluation.** The instructor should use a checklist to evaluate student proficiency in performing the following skills:	Explain procedures to be followed in the practice and evaluation session.
	a. ***Airway care and pulmonary resuscitation—adults.*** Working on an adult resuscitation manikin, each student should demonstrate proficiency in airway care and resuscitation for patients with and without suspected spine injuries. Performance should include:	Follow latest Heart Association procedures.
	1) *Unconscious patient* a) Establishing unresponsiveness b) Opening airway; establishing breathlessness c) Ventilating lungs d) Checking for foreign material e) Dislodging obstructions; checking for foreign material f) Ventilating lungs g) Repeating e) and f) as necessary h) Maintaining ventilation at proper rate	Inform student when material is dislodged.
	2) *Conscious patients who become unconsious* a) Identifying obstruction b) Dislodging obstruction c) Placing patient supine d) Opening airway e) Ventilating lungs f) Dislodging obstructions; checking for foreign material g) Ventilating lungs h) Repeating f) and g) as necessary i) Maintaining ventilation at proper rate	Advise student when patient becomes unconscious. Inform student when material is dislodged.
	b. ***Airway care and pulmonary resuscitation—infants.*** Working on an infant resuscitation manikin, each student should demonstrate proficiency in airway care	

Time (Elapsed) Actual	Contents	Instructor Notes
	and resuscitation. Performance should include: 1) Establishing unresponsiveness 2) Opening airway; establishing breathlessness 3) Ventilating the lungs 4) Checking for foreign material 5) Dislodging obstructions; checking for foreign material 6) Ventilating the lungs 7) Repeating 5) and 6) as necessary 8) Maintaining ventilation at proper rate	Inform student when material is dislodged.
	c. ***Bag-valve-mask technique of pulmonary resuscitation.*** Working on a resuscitation manikin, each student should demonstrate proficiency in ventilation with the bag-valve-mask resuscitator. Performance should include: 1) Selecting correct mask size 2) Inflating collar if necessary 3) Opening the airway 4) Applying the mask—obtaining a tight seal 5) Ventilating the lungs 6) Maintaining ventilation at proper rate	
	d. ***One-man cardiopulmonary resuscitation—adult—witnessed arrest.*** Working on an adult resuscitation manikin, each student should demonstrate proficiency in performing cardiopulmonary resuscitation for a witnessed cardiac arrest. Performance should include: 1) Establishing unresponsiveness 2) Checking for breathlessness and pulselessness 3) Delivering precordial thump 4) Ventilating lungs 5) Palpating the carotid artery 6) Compressing the sternum 7) Alternating ventilations and compressions at proper rate and compression	
	e. ***One-man cardiopulmonary resuscitation—infant.*** Working on an infant resuscitation manikin, each student should demonstrate proficiency in performing cardiopulmonary resuscitation. Performance should include: 1) Establishing unresponsiveness 2) Opening airway; establishing breathlessness 3) Ventilating lungs 4) Establishing pulselessness 5) Compressing the sternum 6) Alternating ventilations and compressions at proper rate and compression	
	f. ***Two-man cardiopulmonary resuscitation—adult—unwitnessed cardiac arrest.*** Working in pairs on an adult resuscitation manikin, each student should demonstrate proficiency in performing two-man cardiopulmonary resuscitation. Performance should include: 1) Establishing unresponsiveness	

Time (Elapsed) Actual	Contents	Instructor Notes

2) Opening airway; establishing breathlessness
3) Ventilating the lungs
4) Establishing pulselessness
5) Compressing the sternum
6) Alternating ventilations and compressions at proper rate and compression
7) Changing positions while maintaining ventilation and compression rate

g. ***Airways.*** Working on an adult manikin, each student should demonstrate proficiency in inserting oropharyngeal and nasopharyngeal airways. Performance should include:

1) *Oropharyngeal airway*
a) Opening mouth using cross-finger technique
b) Inserting airway with tip facing upward
c) Rotating airway 180° when halfway in
d) Completing insertion of rotated airway

2) *Nasopharyngeal airway*
a) Lubricating the airway
b) Inserting the airway

h. ***Suction equipment.*** Working on a manikin, instructor or fellow student, each student should demonstrate proficiency in using suction equipment. Performance should include:

1) Switching on suction
2) Clamping tubing
3) Checking pressure dial
4) Attaching catheter or tonsil sucker
5) Opening the mouth using the cross-finger technique
6) Inserting catheter or tonsil sucker
7) Applying suctioning
8) Closing down equipment

i. ***Oxygen equipment.*** Working on a manikin, instructor or fellow student, each student should demonstrate proficiency in using oxygen equipment. Performance should include:

1) Removing the protective cap
2) "Cracking" the valve
3) Attaching the regulator-flowmeter
4) Attaching the humidifier as appropraite
5) Reducing the pressure
6) Regulating the flow
7) Connecting the administering apparatus
8) Administering oxygen
9) Shutting down the equipment

j. ***Blood pressure.*** Working on an instructor or fellow student, each student should demonstrate proficiency in taking blood pressure. Performance should include:

1) Fastening and inflating the cuff
2) Placing the diaphragm or bell over the brachial artery

Time (Elapsed) Actual	Contents	Instructor Notes
	3) Releasing air and recording systolic and diastolic pressures *Note:* The student should also measure systolic pressure by palpation.	
	k. ***Tourniquet.*** Working on an instructor or fellow student, each student should demonstrate proficiency in applying a tourniquet to an extremity. Performance should include:	
	1) Selecting and folding an appropriate bandage	
	2) Wrapping the bandage around the extremity twice and tieing a half knot	
	3) Placing a stick in the knot and completing tieing a square knot	
	4) Twisting the stick and tieing it in position	Do not prevent circulation in the extremity.
	5) Marking the patient	
	l. ***Primary patient survey.*** Working on an instructor or fellow student, each student should demonstrate performing an examination for life-threatening problems. The instructor should provide any information needed. Performance should include:	
	1) Checking for state of consciousness	
	2) Checking respirations	
	3) Checking pulse	
	4) Checking for life-threatening bleeding and shock—including descriptions of all appropriate signs	
(3:00)		

Lesson 7

Wounds

Objectives

Review student performance during the previous practice, test and evaluation session

Provide the student with sufficient information for him to:

Describe the design and functions of the skin including the epidermis, dermis and subcutaneous tissue

Identify the various wound types and describe their signs and significance

Describe emergency care appropriate to each wound type

Provide the student with sufficient practice for him to demonstrate proficiency in dressing and bandaging wounds of the following body parts:

Arm/leg

Elbow/knee

Top of head

Forehead/scalp

Ear/cheek

Jaw

Neck

Shoulder/hip

Hand/foot

Requirements

Equipment/material:

Universal dressing (one for each two students)

Gauze pad (one for each student)

Roller bandage (1", 2" and 3") (one for each student)

Bandage scissors (one for each 6 students)

Stick or similar object to simulate an impaled object (one for each 6 students)

Adhesive-type dressing

Occlusive dressing

Self-adherent bandage

Gauze roll

Triangular bandage

Adhesive tape (one for each 6 students)

Air splint

Suggested illustrations (chart, slide, drawing):

Skin layers

Contusion

Hematoma

Abrasion

Laceration

Avulsion

Puncture

Stabilized impaled object

Instructors:

One for each 6 students during practice period.

The instructor for the review portion of this lesson should be an individual knowledgeable about the previous practice,

test and evaluation session.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outline as appropriate when you deliver your lecture.
4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.
5. Assure that all equipment and materials required for the lesson are available.
6. Brief all instructor aides regarding their roles and responsibilities during the lesson.
7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.

[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 12, 14 and 17.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	*Note:* The review part of the lesson should be conducted by an individual knowledgeable about the previous practice, test and evaluation session.
Review of Previous Lesson (0:05) 0:20	1. Written test—correct answers and common errors made in the written test administered in the previous lesson. 2. Practical examination—overall class performance and common errors made in demonstration of skills in the previous lesson.	Distribute student tests. Review test pointing out correct answers and discussing common errors. Review overall performance and discuss types of errors made by class members.
Introduction (0:25) 0:05	1. **Lesson coverage** a. Review of previous lesson. b. Design and functions of the skin. c. Types of wounds and their signs and significance. d. Emergency care appropriate to each wound type. e. Techniques of dressing and bandaging. *Note:* Dressing and bandaging will be confined to the extremities, head, neck, shoulders, and hip. Dressing and bandaging of the chest and eye will be covered in subsequent lessons.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered.
	2. **Lesson objectives** a. Review student performance during the previous practice, test and evaluation session. b. Describe the design and functions of the skin. c. Identify the various wound types and describe their signs and significance. d. Describe emergency care appropriate to each wound type. e. Demonstrate dressing and bandaging wounds of the following body parts: 1) Arm/leg 2) Elbow/knee 3) Top of head 4) Forehead/scalp 5) Ear/cheek 6) Jaw 7) Neck 8) Shoulder/hip 9) Hand/foot	Refer to lesson objectives in Student Study Guide and review with class.
The Skin (0:30) 0:10	1. **Functions** a. ***Protection of the body.*** Skin is watertight and not penetrable by bacteria.	If new instructor, introduce self and instructor aides. Explain how these functions are carried out.

Time (Elapsed) Actual	Contents	Instructor Notes
	b. ***Regulation of body temperature.*** Water evaporates from the skin surface in hot weather and skin blood vessels constrict in cold weather.	
	2. **Layers**	
	a. ***Epidermis***	Refer to illustration of skin layers.
	1) Outermost layer consists of dead cells constantly being rubbed off and replaced.	
	2) Deeper part of the epidermis contains cells with some pigment granules.	
	b. ***Dermis.*** The dermis contains many special structures of the skin:	
	1) Sweat glands	Describe design and function of each.
	2) Sebaceous glands	
	3) Hair follicles	
	4) Blood vessels	
	5) Specialized nerve endings	
	3. **Subcutaneous tissue.** Beneath the skin is a layer composed largely of fat that serves as a body insulator.	
Closed Soft-Tissue Injuries (0:40) 0:10	1. **Types**	
	a. Closed injuries may range from damaged tissue beneath the skin to severe internal injuries.	
	b. A contusion (or bruise) develops in the damaged tissue.	Refer to illustration of a contusion.
	c. When much tissue is damaged, blood may pool in the damaged tissue and a hematoma may form.	Refer to illustration of a hematoma and describe its seriousness in bad fractures.
	2. **Management**	
	a. Small bruises require no special care.	
	b. For severe injuries, bleeding should be controlled by counterpressure.	Explain that cold packs may help reduce swelling.
	c. If bleeding is associated with a fracture, splinting is a must.	
Ten-Minute Break (0:50) 0:10		
Open Soft Tissue Injuries (1:00) 0:10	1. **Types**	Refer to illustrations of each type and describe distinguishing features.
	a. Abrasion	
	b. Laceration	
	c. Avulsion	
	d. Puncture	
	2. **Management.** Procedures are:	

Time (Elapsed) Actual	Contents	Instructor Notes
	a. Control bleeding (direct pressure, pressure points, elevation, tourniquet if necessary, splints for fractures).	Ask class to identify techniques for controlling bleeding.
	b. Prevent further contamination—all open wounds will already be contaminated but a sterile dressing and bandage will prevent further contamination. Clothing covering the wound should be removed.	
	c. Immobilize the part and keep the patient quiet.	
	d. Preserve avulsed parts.	
	e. Do not remove impaled objects: 1) Stabilize the object with a bulky dressing. 2) Shorten the object if necessary.	Give reasons. Emphasize dangers in putting pressure on the object or tissue adjacent to it. Refer to illustration of stabilized impaled object.
Dressing and Bandaging (1:10) 0:20	1. **Functions** a. Stop bleeding. b. Protect wound from further damage. c. Prevent further contamination and infection.	
	2. **Dressings** a. Universal dressings. b. 4" x 4" gauze pads. c. Adhesive-type dressings. d. Occlusive dressings.	Display each type, describe design features and use.
	3. **Bandages** a. ***Purpose.*** A bandage holds a dressing in place. It should be tight enough to control bleeding but not so tight as to interfere with circulation.	
	b. ***Types*** 1) Self-adherent bandages. 2) Gauze rolls. 3) Triangular bandages. 4) Adhesive tape. 5) Air splint.	Display each type, describe design features and use. Point out dangers of elastic bandages.
	4. **Applying a pressure dressing.** Procedures are: a. Cover wound with bulky sterile dressing. b. Apply hand pressure over wound until bleeding stops. c. Apply firm roller bandage. d. Check for bleeding and circulation. e. Apply additional dressings and bandages as necessary.	Demonstrate on a student.
Demonstration and Practice (1:30) 1:30	1. **General comments.** There are no hard and fast rules for dressing and bandaging wounds as long as the following conditions are met:	Divide class into groups of 6.

Time (Elapsed) Actual	Contents	Instructor Notes
	a. Bleeding is controlled. b. The dressing is opened carefully and handled in an aseptic manner. c. The dressing adequately covers the wound. d. The dressing and bandage are firm and snug but not so tight as to affect the blood supply to the restricted parts. e. The bandage is securely tied or fastened in place so that it will not move. f. There are no loose ends that could get caught on other objects while the patient is being moved.	Provide a 10-minute break during the practice session. Demonstrate dressing and bandaging techniques. Emphasize aseptic procedures.
(3:00)	2. **Student practice.** Working in groups of two, each student should practice dressing and bandaging open or closed wounds in the following body areas: a. Arm/leg. b. Elbow/knee. c. Top of head. d. Forehead/scalp. e. Ear/cheek. f. Jaw. g. Neck. h. Shoulder/hip. i. Hand/foot. *Note:* At least one wound for each student should be an impaled object. The instructor could tape a small stick or similar object to the body part. *Note:* For at least one wound for each student, the instructor should indicate that bleeding has not been controlled. *Note:* The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	Monitor and critique each student. Permit students to practice until they perform without error.

Lesson 8

Principles of Musculoskeletal Care and Fractures of the Upper Extremity

Objectives

Provide the student with sufficient information for him to;

Describe the design and functions of the skeletal system.

Name all bones in the upper extremity.

Identify muscle types and give examples of each.

Identify and describe the types of fractures.

Define fractures, dislocations and sprains and identify their signs and symptoms.

Describe procedures for examining patients for fractures of the extremities.

Describe reasons for splinting fractures.

Identify general splinting rules.

Describe causes, signs and techniques of care for fractures of the upper extremity.

Provide the student with sufficient practice for him to demonstrate proficiency in immobilizing fractures and dislocations of the upper extremity.

Requirements

Equipment/material:

Skeleton

Padded arm splints (one set for each 2 students)

Triangular bandages (four for each 2 students)

Roller-type bandages (one for each 2 students)

Air splint (one for each 6 students)

Blanket (one for each 6 students)

Cardboard/ladder/aluminum splints (one set for each 2 students)

Improvised splinting materials—magazines, pillows, etc.

Suggested illustrations (chart/slide/drawing):

Muscular system

Greenstick fracture

Transverse fracture

Oblique fracture

Spiral fracture

Comminuted fracture

Impacted fracture

Angulated fracture

Fracture of the clavicle

Fracture of the scapula

Dislocation of the acromioclavicular joint

Anterior dislocation of the shoulder joint

Fractures of the shaft and proximal and distal ends of the humerus

Dislocations of the elbow joint

Fractures of the proximal ulna and radius

Fractures of the forearm

Fractures of the wrist

Dislocations of the wrist

Fractures of the hands and fingers

Note: Instructor should attempt to obtain X-rays or slides of X-rays to clarify information on fractures and dislocations.

Instructors:

One for each 6 students during practice period.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.
4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.
5. Assure that all equipment and materials required for the lesson are available.
6. Brief all instructor aides regarding their roles and responsibilities during the lesson.
7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.
8. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injures.** (Second Edition) Chicago, Illinois, '77. Chapters 4, 13, 15, 16, 17 and 18.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage** a. Design and functions of the muscular and skeletal systems. b. Types of fractures. c. Signs and symptoms of fractures, dislocations and sprains. d. Examining the patient for fractures. e. Splinting fractures and dislocations of the upper extremity. 2. **Need for lesson.** Various types of fractures will be encountered in accident situations. Proper care of the fracture patient will improve his recovery time and minimize additional damage to injured tissues.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered.
	3. **Lesson objectives** a. Describe the design and functions of the skeletal system b. Name all bones in the upper extremity. c. Identify muscle types and give examples of each. d. Identify and describe the types of fractures. e. Define fractures, dislocations and sprains and identify their signs and symptoms. f. Describe procedures for examining patients for fractures. g. Describe reasons for splinting fractures. h. Identify general splinting rules. i. Describe causes, signs and techniques of care for fractures of the upper extremity. j. Demonstrate proficiency in immobilizing fractures and dislocations of the upper extremity.	Refer to lesson objectives in Student Study Guide and review with class.
The Muscular System (0:10) 0:05	1. **Functions** a. Muscle is a special form of tissue that contracts or shortens when stimulated. b. Muscles permit the body to move.	Refer to illustration of muscular system.
	2. **Types** a. ***Voluntary (skeletal) muscles*** 1) Actions are under conscious control. 2) They are attached to bones directly or by tendons. 3) They are the bulk of the muscles forming the arms and the legs. 4) The diaphragm can be voluntarily controlled but one cannot hold one's breath forever; it is therefore both a voluntary and an involuntary muscle.	Explain how contraction of muscles permits movement. Ask a member of the class if the diaphragm is a voluntary muscle.

Time (Elapsed) Actual	Contents	Instructor Notes
	b. ***Involuntary (smooth) muscles***	
	1) Actions are not under conscious control.	
	2) They handle the work of all internal organs except the heart.	Identify organs under involuntary control and explain their actions.
	c. ***Cardiac muscle.*** The heart is a special kind of involuntary muscle with a very good blood supply and its own regulatory system.	
The Skeletal System (0:15) 0:10	1. **Functions.** The skeleton normally has 206 bones. It has the following functions:	Identify bones on skeleton.
	a. It gives form to the body.	
	b. It supports the body and permits us to stand erect.	
	c. Muscles attached to the skeleton by ligaments permit motion at most places (joints) where bones join together. There is no motion at a fused joint.	Identify joints that do and do not permit motion. Demonstrate any motion involved.
	d. It protects body organs, that is:	
	1) The brain is in the skull.	
	2) The heart and lungs are protected by the rib cage.	
	3) Much of the liver and spleen are protected by the lower ribs.	
	4) The spinal cord lies deep within the spinal canal.	
	2. **Skull.** The skull has two main divisions:	
	a. Cranium	
	b. Face	
	3. **Spinal column.** It has 33 bones, called vertebrae, and 5 sections:	
	a. Cervical spine	
	b. Thoracic spine	
	c. Lumbar spine	
	d. Sacral spine	Describe dangers of spine injuries.
	e. Coccygeal spine	
	4. **Thorax.** The thorax is made up of:	
	a. Twelve pairs of ribs	
	b. Twelve thoracic vertebrae	
	c. Sternum	
	5. **The upper extremity.** The upper extremities are designed as follows:	
	a. ***Shoulder girdle.*** The upper extremities are attached to the shoulder girdle which is formed largely by the shoulder blade (scapula) and the collarbone (clavicle).	
	b. ***Arm.*** The arm (shoulder to elbow) has one bone known as the humerus.	
	c. ***Forearm.*** The forearm (elbow to wrist) has two bones: the radius on the thumb side and the ulna on the little finger side.	
	d. ***Hand.*** The hand has many bones including those of the wrist and fingers.	

Time (Elapsed) Actual	Contents	Instructor Notes
	6. **Pelvis and the lower extremity.** The pelvis and lower extremities are designed as follows:	
	a. ***Pelvis.*** The pelvis is a bony ring formed by the sacrum and two pelvic bones.	
	b. ***Hip joint.*** The lower extremity is attached to the pelvis at the hip joint.	
	c. ***Upper leg (thigh).*** The upper leg contains one bone known as the femur. It is the longest, heaviest and strongest bone of the body. Fractures of the femur are serious.	
	d. ***Lower leg.*** The lower leg has two bones: the tibia in front and fibula in back.	
	e. ***Foot.*** As with the hand, the foot has many bones.	
	f. ***Kneecap.*** The leg also has a bone at the kneecap known as the patella.	
General Concepts of Fractures and Dislocations (0:25) 0:15	1. **Fractures**	
	a. ***Definition.*** A fracture means a break in a bone.	
	b. ***Types.*** Basically, fractures are of two types:	
	1) *Open (compound).* The skin has been broken.	
	2) *Closed (simple).* The skin has not been broken.	
	Note: Both open and closed fractures can result in serious blood loss. In addition open fractures have the danger of infection.	
	c. ***Other classifications.*** Fractures may also be classified by appearance:	
	1) Greenstick	Refer to illustration of each type and describe distinguishing features.
	2) Transverse	
	3) Oblique	
	4) Spiral	
	5) Comminuted	
	6) Impacted	
	d. ***Signs***	
	1) *Deformity.* The arm or leg may be angled where there is no joint.	Refer to illustration of angulated fracture.
	2) *Tenderness.* The point of the break may be tender or sore.	
	3) *Crepitus.* If the patient moves, there may be a grating sound where the broken ends of the bone rub together. The rescuer should not attempt to confirm this sign since movement of the broken ends could damage nerves and blood vessels.	
	4) *Swelling and discoloration.* Swelling and discoloration due to fluid or blood in the tissues may not be apparent for several hours.	
	5) *Loss of use.* The patient will not be able to move the limb or will do so with great pain.	
	6) *Exposed fragments.* In open fractures, fragments of the bone may protrude through the skin.	Explain also that the mechanism of injury may lead the rescuer to expect a fracture.
	2. **Dislocations**	

Time (Elapsed) Actual	Contents	Instructor Notes
	a. ***Definition.*** A dislocation is the displacement of the bone ends that form a joint.	Refer to illustrations of dislocated finger and shoulder.
	b. ***Location.*** Any movable joint may be dislocated; those frequently dislocated are the shoulder, elbow, fingers, hip and ankle.	
	c. ***Signs.*** Signs are similar to those for fractures, the most important being:	
	1) Deformity of the joint	
	2) Pain or swelling	
	3) Loss of movement	
	4) A joint locked in a deformed position	
	3. **Sprains**	
	a. ***Definition.*** A sprain is a partial tear or stretching of a ligament.	
	b. ***Signs.*** Signs are similar to those for fractures and dislocations except there are never protruding bone fragments and there is no deformity at a joint.	
	4. **Differentiating between fractures, dislocations and sprains**	
	a. ***Differentiating signs.*** The following signs can be used to diagnose a fracture or dislocation:	
	1) Fracture—an angle in an arm or leg where there is no joint.	
	2) Fracture—an open wound with a bone or bone fragments protruding.	
	3) Dislocation—a deformity at a joint.	
	b. ***General comment.*** If the above signs are not present but there is pain or tenderness or loss of movement of an extremity, it should be assumed that there is a fracture and the limb should be treated accordingly.	
Examine the Patient for Injuries (0:40) 0:15	1. **Stages.** As indicated previously, a patient survey is performed in two stages: an initial survey of life-threatening problems and a secondary survey of injuries not threatening to life.	Explain that an examination for injuries will be demonstrated even though implicataions of all signs for all injuries have not been covered. They will be covered in subsequent lessons. In this lesson, the student will be responsible only for describing procedures for examining a patient for fractures of the extremities.
	2. **Secondary survey.** In the secondary survey, the EMT makes a head-to-toe examination of the patient. He systematically observes and feels for wounds and deformities. He asks conscious patients if they feel pain or sensation. For unconscious patients, he checks for indications of pain, sensation and reflex action.	
	Note: The EMT should always observe the accident scene and check witnesses to attempt to determine any mechanism of injury.	
	Note: Emphasize importance of establishing rapport with conscious patient—identifying self, obtaining and using patient's name, explaining intended movements and procedures, reassuring patient.	
	a. ***Head***	Demonstrate on a student. Explain what you are doing, implications of what you
	1) Observe for confusion, unresponsiveness, unconsciousness.	

Time (Elapsed) Actual	Contents	Instructor Notes
	2) Check pupils. 3) Observe for lacerations and contusions about the face and scalp. 4) Feel gently for depressions in the skull. 5) Check ears and nose for fluid or blood. 6) Check mouth for foreign objects, bleeding. b. ***Neck*** 1) Observe for cuts, bruises, deformities. 2) Feel for areas of tenderness, deformities. c. ***Upper extremities*** 1) Check for cuts, bruises, pain, deformities, unusual positions. 2) Check for sensation. 3) Ask patient if he can move arms. d. ***Chest*** 1) Check for bruises, pain, deformities. 2) Check that both sides of the chest expand normally upon inspiration. e. ***Back and buttocks*** 1) Check for cuts, bruises, pain, deformities. f. ***Abdomen and pelvis*** 1) Check abdomen for tenderness, rigidity. 2) Compress pelvis gently. g. ***Lower extremities*** 1) Check for cuts, bruises, pain, deformities, unusual positions. 2) Check for sensation. 3) Ask patient if he can move his legs. h. ***Medical alert symbols*** 1) Check for tags, bracelets, etc.	find and actions you would take.
Ten-Minute Break (0:55) 0:10		
General Principles of Splinting (1:05) 0:10	1. **Reason for splinting** a. The primary objective for splinting is to prevent motion of bone fragments or dislocated joints. b. Good emergency care can decrease hospital time and speed the patient's recovery by preventing or minimizing the following complications: 1) Damage to muscles, nerves or blood vessels caused by broken ends of bone. 2) Laceration of the skin, that is, a closed fracture becomes an open fracture. 3) Restriction of blood flow as a result of bone ends pressing against blood vessels. 4) Excessive bleeding due to bone ends.	

Time (Elapsed) Actual	Contents	Instructor Notes
	5) Increased pain associated with movement of bone ends. 6) Paralysis of extremities due to fractured spine—discussed in a subsequent lesson.	
	2. **General rules** a. Remove or cut away clothing. b. Cover all wounds with a sterile dressing. c. Do not replace protruding bones. d. Note and record circulation and neurological status distal to the injury. e. Straighten deformities near joint with gentle steady traction unless pain is significant or resistance to correction is encountered. f. Straighten an angulated fracture before splinting—use gentle traction. g. Correct neck and spine deformities only if necessary to maintain an open airway. h. Pad each splint carefully to prevent pressure and discomfort to the patient. i. Immobilize the joint above and below the fracture or dislocation. j. Splint the patient **before** moving him. k. When in doubt, splint.	
Splinting the Upper Extremity (1:15) 0:45	1. **Equipment** a. Splints—rigid and air b. Sling c. Swathe d. Pillow e. Magazines	Display and describe splints and triangular and roller type bandages.
	2. **Fractures of the clavicle**—apply a sling. 3. **Fracture of the scapula**—apply a sling. 4. **Dislocations of the acromioclavicular joint**—apply a sling. 5. **Anterior dislocations of the shoulder joint**—place pillow or rolled blanket between area and chest, apply sling and swathe. 6. **Fractures of the humerus** a. ***Proximal end***—apply sling and swathe or bind arm to trunk. b. ***Shaft***—apply sling and swathe. c. ***Distal end***—apply sling and swathe or long-arm padded splint; check circulation. 7. ***Dislocations of the elbow joint***—apply sling and swathe or long-arm padded splint; check circulation.	Describe typical causes of each type of fracture or dislocation. Display illustration of each type and describe signs. Demonstrate application of splints, slings and swathe. Demonstrate application of improvised splints—pillows, magazines, etc.—and local splinting options.

Time (Elapsed) Actual	Contents	Instructor Notes
	8. **Fractures of the proximal ulna and radius**—apply an air splint, folded pillow, long-arm padded splint, or sling and swathe. 9. **Fractures of the forearm**—apply an air splint or long-arm padded splint; apply sling. 10. **Fractures of the wrist**—apply padded board splint or air splint; apply sling. 11. **Dislocations of the wrist**—straighten gently; apply an air splint or long-arm padded splint; apply sling. 12. **Fractures and dislocations of the hand and fingers**—splint in position of function—place roll of gauze in palm; apply air or padded splint.	
Ten-Minute Break (2:00) 0:10		
Practice (2:10) 0:50	1. Working in pairs, each student should practice immobilizing fractures of: a. Clavicle (using sling) b. Humerus (using sling and swathe) c. Elbow (using rigid splint) d. Forearm (using air and rigid splints) 2. Working in pairs, each student should practice immobilizing dislocations of the shoulder using a blanket, sling and swathe. *Note:* The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	Divide class into groups of 6. Monitor and critique each student. Permit students to practice until they can perform without error.
(3:00)		

Lesson 9

Fractures of the Pelvis, Hip and Lower Extremity

Objectives

Provide the student with sufficient information for him to:

Name the bones in the lower extremity

Identify causes, signs, dangers and emergency care for:

Fractures of the pelvis

Anterior and posterior dislocations of the hip

Fractures of the hip

Fractures of the shaft of the femur

Sprains, dislocations and fractures of the knee

Dislocations of the patella

Fractures of the tibula or fibula shaft

Injuries about the ankle

Fractures of the foot

Provide the student with sufficient practice for him to demonstrate proficiency in immobilizing fractures and dislocations of the hip and lower extremity.

Provide the student with practice in performing a patient examination for injuries.

Requirements

Equipment/material:

Skeleton

Long air splint (one for each 6 students)

Long padded rigid splint (one set for each 6 students)

Short padded rigid splint (one set for each 6 students)

Traction splint (one for each 3 students)

Triangular bandages (four for each student)

Pillow (one for each 6 students)

Blanket (one for each two students)

Long backboard with associated straps (one for each 6 students)

Improvised splinting materials—magazines, pillows, etc.

Cardboard/ladder/aluminum splints (one set for each 2 students)

Suggested illlustrations (chart/slide/drawing):

Pelvic girdle and its contents

Anterior and posterior hip dislocations

Fractured hip

Fractured femur

Deformed sprained knee

Dislocated knee

Fractured knee

Dislocated patella

Fractured tibia

Fractured ankle

Note: Instructor should attempt to obtain X-rays or slides of X-rays to clarify information on fractures and dislocations.

Instructors:

One for each 6 students during practice period.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outline as appropriate when you deliver your lecture.
4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.
5. Assure that all equipment and materials required for the lesson are available.
6. Brief all instructor aides regarding their roles and responsibilities during the lesson.
7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.
8. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 4, 17 and 19.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage.** Causes, signs, dangers, care for fractures/dislocations of lower extremity; practice in performing examination for injuries. 2. **Need for lesson.** Fractures of the femur can result in severe blood loss. Fractures of the pelvis can result in injuries to internal organs. Proper care of all fracture patients will improve their recovery time and minimize additional damage to injured tissues. 3. **Lesson objectives** a. Name the bones in the lower extremity. b. Identify causes, signs, dangers and emergency care for: 1) Fractures of the pelvis 2) Anterior and posterior dislocations of the hip 3) Fractures of the hip 4) Fractures of the shaft of the femur 5) Sprains, dislocations and fractures of the knee 6) Dislocations of the patella 7) Fractures of the tibia or fibula shaft 8) Injuries about the ankle 9) Fractures of the foot c. Demonstrate proficiency in immobilizing fractures and dislocations of the hip and lower extremity. d. Perform a patient examination for injuries.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered. Refer to lesson objectives in Student Study Guide and review with class.
The Pelvis (0:10) 0:05	1. **Anatomy and physiology** a. The pelvic girdle is formed by the lower five vertebrae (which are fused together and known as the sacrum) and the hip bones. b. It contains the sockets of the hip joints that join with the femur. c. It protects the lower portion of the abdominal cavity including the bladder, rectum and internal female sexual organs.	Refer to illustration of pelvic girdle and its contents. Identify bones.
	2. **Fractures** a. ***Signs.*** Patient complains of pain. Pain is felt when sides of the pelvis are compressed. b. ***Transportation.*** The patient should be transported on a long spineboard. c. ***Dangers.*** Shock may result since blood loss can be severe. There may be injuries to organs of the genitourinary system.	Discuss typical causes. Demonstrate compression. Explain procedures. Refer to illustration of pelvic girdle and its contents.

Time (Elapsed) Actual	Contents	Instructor Notes
The Hip (0:15) 0:10	1. **Dislocations**	Describe common causes. Refer to illustrations of anterior and posterior hip dislocations.
	a. ***Anterior dislocation.*** The thigh is stretched out from the side of the body, lies flat and is externally rotated away from the body.	
	b. ***Posterior dislocation.*** The knee is typically drawn up and the thigh is rotated inward toward the body. The patient may be unable to raise his toes or his foot if the sciatic nerve has been damaged.	
	c. ***Emergency care.*** The dislocated limb should be supported by pillows or rolled blankets and long straps. The patient should be transported on a rigid stretcher.	Demonstrate on student.
	2. **Fractures**	Describe common causes. Refer to illustration of fractured hip.
	a. ***Signs.*** The patient will usually lie with the foot turned outward. The leg may appear to be shortened.	
	b. ***Dangers.*** Shock may result since blood loss can be severe.	
	c. ***Care.*** Application of traction splint is best. Adequate immobilization can be obtained by placing pillows or folded blankets between the legs and tying the legs together.	Demonstrate immobilization by tying legs together.
	Note 1: In demonstrations of techniques for immobilizing fractures, instructor should use splints normally available in the area. Regardless of whether or not these splints are padded, instructor should explain procedures and necessity for padding splints so that students will understand basic principles.	
	Note 2: In demonstrations using traction splints, the instructor should use splints normally available in the area. However, if there are splints that contain built-in leg support and ankle hitches, the instructor **should also** demonstrate **and** have class practice on a traction splint that requires use of triangular bandages for leg support and ankle hitches so that students will understand basic principles involved.	
Fractures of the Shaft of the Femur (0:25) 0:15	1. **Signs.** There is marked deformity. The leg below the fracture will be severely angulated or rotated. Fractures are often open.	Refer to illustration of fractured femur.
	2. **Dangers.** Shock may develop as there will be a large blood loss whether the fracture is open or closed. Circulation in the foot may be impaired.	
	3. **Care.** The leg should be gently straightened and immobilized with a traction splint.	Demonstrate application of a traction splint. Remind students not to use excess traction.
Injuries About the Knee (0:40) 0:10	1. **Sprains**	
	a. ***Signs.*** Deformity may be apparent with the leg bent at an awkward angle away from the knee joint.	Refer to illustration of deformed sprained knee.
	b. ***Care.*** The leg should be gently straightened and a long-leg	Demonstrate application of

Time (Elapsed) Actual	Contents	Instructor Notes
	rigid splint applied. All suspected sprains should be splinted with a long-leg rigid splint or air splint.	a long-leg rigid splint and air splint.
	2. Dislocations	
	a. ***Signs.*** Deformity is grotesque. Circulation in the foot may be impaired.	Refer to illustration of dislocated knee.
	b. ***Care.*** The deformity should be gently straightened. The leg should be immobilized with a traction splint (no traction), a rigid long-leg splint, an air splint, or pillow or blanket splint.	
	Note: The EMT should never force a deformity straight and should never straighten a deformity if it causes increased pain to the patient.	
	3. Fractures	
	a. ***Signs.*** There is usually much pain and swelling and there may be significant deformity. Circulation in the foot may be impaired.	Refer to illustration of fractured knee.
	b. ***Care.*** The deformity should be gently straightened, and a splint applied as for dislocations.	
	4. Dislocation of the patella	
	a. ***Signs.*** Usually the knee is flexed.	Refer to illustration of dislocated patella.
	b. ***Care.*** The leg should be gently straightened. The leg should be immobilized in a long-leg splint or air splint.	
Ten-Minute Break (0:50) 0:10		
Fractures of the Tibia or Fibula Shaft (1:00) 0:05	1. **Signs.** The leg may be severely deformed. Fractures of the tibia are frequently open. Circulation in the foot may be impaired.	Refer to illustration of fractured tibia.
	2. **Care.** The deformity should be gently straightened. A traction splint, long-leg rigid splint or air splint may be applied.	
Injuries About the Ankle (1:05) 0:05	1. **Signs.** There may be severe deformity. It will probably not be possible to differentiate between a dislocation and a fracture.	Refer to illustration of fractured ankle.
	2. **Care.** Deformities should be gently straightened. A long- or short-leg rigid splint, air splint or pillow splint should be applied.	Demonstrate application of short-leg splint.

Time (Elapsed) Actual	Contents	Instructor Notes
Fractures of the Foot (Tarsals, Metatarsals, Phalanges) (1:10) 0:05	1. **Signs.** There is usually pain and swelling. A spine injury should be suspected if heel pain is associated with back pain.	Explain reason.
	2. **Care.** The foot should be immobilized in a rigid short-leg splint, air splint or pillow splint.	Demonstrate application of pillow splint.
Practice (1:15) 1:45	1. Working in groups of two or three as appropriate, each student should practice the following:	Divide class into groups of 6. Provide a 10-minute break during the practice period.
	a. Immobilizing a fractured hip with a pillow or blanket.	
	b. Immobilizing a fractured femur with a traction splint.	
	c. Immobilizing a fractured femur with a long board splint.	
	d. Immobilizing a dislocated knee with an air splint.	
	e. Immobilizing a fractured ankle with a short board splint.	
	f. Immobilizing a fractured foot in a pillow splint.	
	g. Immobilizing a patient with a fractured pelvis on a long backboard.	
	h. Performing a patient examination for injuries.	
	Note: Each student should make a complete head-to-toe examination of another student under the supervision and guidance of the instructor. Such an examination was demonstrated in Lesson 8. Students should be advised that they will have additional opportunities to practice performing a patient examination in the last lesson on injuries (Lesson 11).	
	Note: The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	
(3:00)		

Lesson 10

Injuries of the Head, Face, Neck and Spine

Objectives

Provide the student with sufficient information for him to:

Describe the design and function of the nervous system.

Describe the main danger associated with fractures of the spine and complications that can result from spine injuries.

Describe how to examine a patient for spine injuries.

Describe what cerebrospinal fluid is and why no attempt should be made to stop bleeding from the nose or ears when a skull fracture is suspected.

Describe the signs of a skull fracture and of brain injuries.

Describe management of patients with skull fractures and with brain injuries.

Describe procedures for continuous monitoring and evaluation of the unconscious patient and implications of data obtained.

Describe means for managing injuries to the face and neck.

Provide the student with practice in immobilizing patients with suspected spine injuries on short and long backboards.

Requirements

Materials/Equipment:

Blanket (three for each 6 students)

Cervical collar (two for each 6 students)

Sandbags (two for each 6 students)

Short backboard with associated straps (one for each 6 students)

Long backboard with associated straps (one for each 6 students)

Illustrations (charts, slides, drawings):

Nervous system

Neural watch chart

Instructors:

One for each 6 students during practice period.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]

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[1]The contents of this lesson were based on the following references:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 20, 21, 22, 24 and 47.

Patient handling manual. Prepared by Dunlap and Associates, Inc., for the U. S. Department of Transportation (DOT-HS-800-504), January 1972. Available from U. S. Government Printing Office, Washington, D. C. Chapter 7.

3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.

4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.

5. Assure that all equipment and materials required for the lesson are available.

6. Brief all instructor aides regarding their roles and responsibilities during the lesson.

7. Before completing the lesson, make sure that all students have an opportunity to practice the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.

8. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

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Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage** a. Design and functions of the nervous system. b. Signs, seriousness and techniques of care for patients with injuries to the head and spine. c. Demonstration and practice in immobilizing patients with suspected spine injuries on short and long backboards.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered.
	2. **Need for lesson** a. Head injuries can result in brain damage, spine injuries in paralysis, and face and neck injuries in severe airway difficulties. b. It is especially important that the rescuer be knowledgeable about the signs, seriousness and management of these patients.	
	3. **Lesson objectives** a. Describe the design and function of the nervous system. b. Describe the main danger associated with fractures of the spine and complications that can result from spine injuries. c. Describe how to examine a patient for spine injuries. d. Describe what cerebrospinal fluid is and why no attempt should be made to stop bleeding from the nose or ears when a skull fracture is suspected. e. Describe the signs of a skull fracture and of brain injuries. f. Describe management of patients with skull fractures and with brain injuries. g. Describe procedures for continuous monitoring and evaluation of the unconscious patient and implications of data obtained. h. Describe means for managing injuries to the face and neck. i. Practice immobilizing patients with suspected spine injuries on short and long backboards.	Refer to lesson objectives in Student Study Guide and review with class.
The Nervous System (0:10) 0:10	1. **Components.** The nervous system consists of the brain, spinal cord, and nerves.	Refer to illustration of nervous system.
	2. **Brain** a. it is the controlling organ of the body and the center of consciousness. b. It occupies the entire space within the cranium. c. Each type of brain cell has a specific function and certain parts of the brain perform certain functions.	Give examples.

Time (Elapsed) Actual	Contents	Instructor Notes
	3. **Spinal cord**	
	a. The spinal cord consists of long tracts of nerves that join the brain with all body organs and parts.	
	b. It is protected by the spinal column.	
	4. **Nerves**	
	a. Sensory nerves send information to the brain on what the different parts of the body are doing relative to their surroundings.	Give examples.
	b. Motor nerves emanate from the brain and result in stimulation of a muscle or organ.	Give examples.
	5. **Actions**	Give examples.
	a. Automatic	
	b. Reflex	
	c. Conscious	
	d. Voluntary control of muscles	
	e. Involuntary control of muscles	
Injuries to the Spine (0:20) 0:30	1. **Dangers**	
	a. It is especially important to provide proper care for patients with suspected spinal injuries since damage to the spinal cord can result in paralysis.	
	b. Therefore, all unconscious accident patients should be treated as if they had spinal injuries and all conscious patients should be carefully checked for spine injuries prior to movement.	
	c. Accident patients with weakness or numbness of arms or legs must be assumed to have spine injuries.	
	2. **Signs.** The following signs may be indicative of spinal cord injury:	List signs on chalkboard.
	a. ***Pain.*** The patient may be aware of pain in the area of injury.	Indicate that the mechanism of injury may indicate spine injury in absence of other signs.
	b. ***Tenderness.*** Gently touching the suspected area may result in increased pain.	
	c. ***Painful movement.*** If the patient tries to move, the pain may increase—never try to move the injured area for the patient.	
	d. ***Deformity.*** Deformity is rare although there may be an abnormal bend or bony prominence.	
	e. ***Cuts and bruises.*** Patients with neck fractures will have cuts and bruises on the head or face. Patients with injuries in other spine areas will have bruises on the shoulders, back or abdomen.	
	f. ***Paralysis.*** If the patient is unable to move or feels no sensation in some part of his body, he may have a spinal fracture.	
	3. **Steps for checking signs and symptoms**	
	a. ***Conscious patients***	

Time (Elapsed) Actual	Contents	Instructor Notes
	1) *Ask*—what happened, where does it hurt, can you move your hands and feet, can your feel me touching your hands (feet)?	Indicate that strength may be determined by having patient squeeze rescuer's hand or by checking pressure against the foot.
	2) *Look*—for bruises, cuts, deformities.	
	3) *Feel*—for areas of tenderness, deformities.	
	4) *Have patient move*—if he can do so comfortably.	
	b. ***Unconscious patients***	
	1) *Look*—for cuts, bruises, deformities.	Explain how to check for reflex actions.
	2) *Feel*—for deformities.	
	3) *Ask others*—what happened?	
	4. **Complications**	
	a. Persons with neck injuries may have paralyzed chest muscles. Breathing can then be accomplished only by the diaphragm. Inadequate breathing and shock may result.	Ask class member to identify and describe care for resultant shock.
	b. Paralysis of the nerves affecting the size of blood vessels may occur and shock may result.	Ask class member to identify and describe resultant shock.
	5. **Emergency care**	
	a. In addition to caring for life-threatening problems, the most important consideration for a victim with a suspected spine injury is to immobilize him **before** moving.	
	b. Unless it is necessary to change a patient's position to maintain an open airway or there is some other compelling reason, it is best to splint the neck or back in the original position of deformity.	Ask class members to describe airway maintenance for patients with spine injuries.
	c. Patients with suspected spine injuries will require cervical collars and immobilization on a spine board or special stretcher. Demonstration and practice will be provided in this and in subsequent lessons.	
	d. A helmet should be removed unless there is difficulty in removing it, increased pain, or the patient is unconscious. In such instances, the patient should be immobilized on the spine board with the helmet in place.	
Ten-Mintue Break (0:50) 0:10		
Injuries to the Skull and Brain (1:00) 0:30	1. **Skull fractures.** Fractures of the skull are common in accident victims. Their seriousness depends on the amount of injury to the brain. Serious brain injury is much more common when there is no skull fracture.	
	a. ***Types.*** Skull fractures may be open or closed. They may also be:	List on chalkboard.
	1) *Linear*—line fracture or crack in the skull. Most skull fractures are of this type.	
	2) *Comminuted*—multiple cracks radiate from the center of impact.	
	3) *Depressed*—pieces of bone are pushed inward pressing on and sometimes causing tearing of brain tissue.	

Time (Elapsed) Actual	Contents	Instructor Notes
	4) *Penetrated skull*—objects such as bullets or knives may penetrate the skull and lodge in the brain—remember, do not remove foreign objects.	
	5) *Basal*—fractures of the base of the skull.	
	b. ***Cerebrospinal fluid***	
	1) The brain and spinal cord are protected by layers of tissue filled with a liquid called cerebrospinal fluid.	
	2) This fluid provides nutrition to some of the brain cells and serves as a shock absorber.	
	3) Cerebrospinal fluid and blood may drain from the nose or ears when a person has a skull fracture.	
	4) Rule of care—do **not** attempt to stop bleeding from the nose or ears when a skull fracture is suspected. Doing so may cause increased pressure on the brain or an infection around the brain.	
	c. ***Signs.*** Signs of a skull fracture include:	List on chalkboard.
	1) Deformity of the skull.	
	2) Blood or clear fluid (cerebrospinal fluid) draining from ears or nose.	
	3) Black eyes.	
	2. **Injuries to the brain**	
	a. ***Concussion***—a temporary loss of function for some or all of the brain.	List on chalkboard.
	1) Patient may be confused or staggering or become totally unconscious and unable to breathe for a short period of time.	
	2) Patient has some loss of memory for events surrounding the accident.	
	b. ***Contusion***—bleeding and abnormal swelling of brain tissue.	
	1) Patient may lose consciousness.	
	2) Paralysis may be present on one side of body or of all four limbs.	
	3) One pupil may dilate.	
	4) Vital signs may progressively deteriorate.	
	c. ***Cerebral hematoma***—blood clot[illegible] on brain tissues. Signs are the same as those for contusions.	
	3. **Emergency care.** Care for patients with suspected head injuries require management of the injury as well as repeated evaluation over time. Procedures are:	
	a. Correct life-threatening problems—maintain respiration and circulation.	
	b. Suspect a cervical or other spine injury in vehicular accidents and falls.	
	c. Control bleeding—not drainage.	
	d. Dress and bandage open wounds—minimize pressure.	
	e. Position according to associated injuries:	
	1) Head elevation if possible (no pillows)—be prepared for vomiting.	

Time (Elapsed) Actual	Contents	Instructor Notes
	2) On the side with head down if there is bleeding or mucus so that it can drain.	
	f. Protect patient from hurting himself if he convulses.	
Monitoring the Unconscious Patient (1:30) 0:10	1. **Special management and evaluation.** Unconscious patients need special management and constant evaluation from contact to delivery at the medical facility.	
	2. **Airway support.** First and foremost is airway support. The semiprone position should improve breathing.	Ask a member of the class to describe airway care procedures.
	3. **Bleeding control.** The scalp may be compressed against the skull with the hand if there is no skull fracture. A pressure dressing and roller bandage should be applied.	
	4. **Cervical spine injury evaluation.** Methods include:	
	a. Observe breathing for paralyzed chest muscles.	Describe signs.
	b. Starting with feet, prick patient lightly with pin and observe face for a grimace.	Describe process and explain indications.
	c. Observe positioning of arms.	Explain indications for spinal injury.
	d. Check blood pressure—it may be below 100 systolic without other signs of hypovolemic shock.	
	e. Observe male for possible penile erection.	
	5. **Maintaining records**—neural watch chart. Baseline data and constant evaluation can aid hospital personnel in determining whether an operation is required.	Refer to neural watch chart, describe data to be collected and how chart should be completed.
Injuries to the Face and Neck (1:40) 0:10	1. **Face and scalp wounds**	
	a. ***General comment.*** The face and scalp are richly supplied with arteries and veins and wounds of these areas bleed heavily.	
	b. ***Emergency care.*** Control by direct pressure. For cheek wounds, it may be necessary to hold a gauze pad inside the cheek as well as outside.	
	c. ***Special considerations***	
	1) Suspect brain or neck injuries for any wounds of the head.	
	2) Check the mouth carefully for any loose objects, such as broken teeth that might impair the airway.	
	3) Check carefully for bleeding into the mouth or throat that might impair the airway.	
	4) Cover exposed nerves, tendons, or blood vessels with a moist bandage.	
	2. **Facial fractures**	
	a. ***Danger.*** The main danger of facial fractures lies in airway problems. Bone fragments and blood may obstruct the airway—check the airway carefully.	
	b. ***Emergency care.*** Emergency care is the same as for soft	

Time (Elapsed) Actual	Contents	Instructor Notes
	tissue injuries, that is, maintain the airway, control bleeding, and dress and bandage open wounds.	
	3. **Neck wounds**	
	a. ***Emergency care***	
	1) Control arterial bleeding by direct pressure.	
	2) If a large vein is torn, apply pressure above and below the point of bleeding to prevent air from entering the circulatory system—the latter could be rapidly fatal.	
	b. ***Special considerations.*** Suspect a neck fracture.	
	4. **Laryngeal and tracheal injury**—the voice box and windpipe may be fractured.	
	a. ***Signs***	
	1) Loss of voice.	
	2) Severe airway obstruction—possibly fatal.	
	3) Crackling sensation due to air leakage in soft tissue of neck.	
	b. ***Emergency care.*** The patient should be kept calm and breathing slowly. Oxygen should be administered.	
Ten-Minute Break (1:50) 0:10		
Demonstration and Practice: Immobilization of Spine Injuries (2:00) 0:10	*Note 1:* Included here are procedures for immobilizing patients with suspected spine injuries on short and long backboards.	Divide class into groups of 6.
	Note 2: Proficiency in these skills is not required in this lesson. Students will have additional opportunities to practice and demonstrate proficiency in these skills in Lessons 18 and 19.	
	1. **Short backboard.** Procedures are:	Demonstrate and have students assist and practice.
	a. Support patient's head.	
	b. Apply cervical collar.	Demonstrate use of a blanket as a collar.
	c. Position short backboard behind patient and pad the board as appropriate.	
	d. Attach straps to patient's forehead, chin and thighs.	
	2. **Long backboard—supine patient.** Procedures are:	Demonstrate and have students assist and practice.
	a. Support patient's head.	
	b. Apply cervical collar.	Demonstrate use of blankets and sandbags. Emphasize advantages of additional help.
	c. Straddle patient and lift shoulders slightly (board positioned at patient's head).	
	d. Shove board beneath patient.	
	e. Pad board as appropriate and secure straps.	
(3:00)	*Note:* The instructor should use the practice period not only for skill practice but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	

Lesson 11

Injuries to the Eye, Chest, Abdomen and Genitalia

Objectives

Provide the student with sufficient information for him to:

Describe the parts, design and function of the eye, thorax, digestive system, and genitourinary system

Describe dangers and techniques of care for foreign bodies in the eye, burns of the eye, eye lacerations and contusions, extruded eyeballs, and blunt trauma to the eye

Describe causes, signs, dangers, and techniques of care for:

Rib fractures

Flail chest

Pneumothorax

Spontaneous pneumothorax

Tension pneumothorax

Hemothorax

Sucking chest wounds

Subcutaneous emphysema

Traumatic asphyxia

Pericardial tamponade

Lacerations of great vascular vessels

Traumatic emphysema

Describe types, causes, signs, dangers and techniques of care for injures to the abdomen and genitalia

Provide the student with sufficient practice for him to demonstrate proficiency in:

Dressing and bandaging a lacerated eye with a protruding object

Dressing and bandaging a sucking chest wound with multiple rib fractures

Perform a complete patient examination for life-threatening problems and injuries

Requirements

Equipment/materials:

Torso with removable organs

Cotton-tipped applicator

Paper cup/cone or eye shield (one for each 6 students)

Dressings and roller bandages (one for each 6 students)

Occlusive dressing (one for each 6 students)

Adhesive tape (one for each 6 students)

Illustrations (chart, slide, drawing):

The eye

Lacerated eye

Extruded eyeball

Flail chest

Abdominal cavity

Digestive system

Urinary system

Male and female reproductive systems

Protruding abdominal organs

Instructors:

One for each 6 students during practice period.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.
4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.
5. Assure that all equipment and materials required for the lesson are available.
6. Brief all instructor aides regarding their roles and responsibilities during the lesson.
7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.
8. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

[1]The contents of this lesson were based on the folllowing reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 6, 23, 24, 25, 26, 28 and 29.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage** a. Anatomy and physiology of the eye, chest, digestive system and genitourinary system. b. Injuries and techniques of care for the eye, chest, abdomen, and genitalia. c. Complete patient examination for life-threatening problems and injuries.	Review lesson coverage and objectives. Emphasize criticality of skills and knowledge covered.
	2. **Need for lesson** a. Injuries to the eye can result in loss of sight. b. Injuries to the chest and abdomen can be life-threatening if internal organs are injured. c. Recognizing the potential seriousness of these injuries and providing appropriate care can make the patient more comfortable, minimize the extent of damage, and possibly save his life. d. A complete patient examination can result in identification of life-threatening problems and injuries prior to patient movement with a consequent reduction in patient morbidity and mortality.	
	3. **Lesson objectives** a. Describe the parts, design and function of the eye, thorax, digestive system, and genitourinary system. b. Describe dangers and techniques of care for foreign bodies in the eye, burns of the eye, eye lacerations and contusions, extruded eyeballs, and blunt trauma to the eye. c. Describe causes, signs, dangers, and techniques of care for: 1) Rib fractures 2) Flail chest 3) Pneumothorax 4) Spontaneous pneumothorax 5) Tension pneumothorax 6) Hemothorax 7) Sucking chest wounds 8) Subcutaneous emphysema 9) Traumatic asphyxia 10) Pericardial tamponade 11) Lacerations of great vascular vessels 12) Traumatic emphysema d. Describe types, causes, signs, dangers and techniques of care for injuries to the abdomen and genitalia. e. Demonstrate proficiency in:	Refer to lesson objectives in the Student Study Guide and review with class.

Time (Elapsed) Actual	Contents	Instructor Notes
	1) Dressing and bandaging a lacerated eye with a protruding object 2) Dressing and bandaging a sucking chest wound with multiple rib fractures 3) Performing a complete patient examination for life-threatening problems and injuries.	
The Eye (0:10) 0:30	1. **Design**—a globe a. Vitreous humor b. Iris c. Pupil d. Cornea e. Sclera f. Conjunctiva g. Eyelids h. Tear glands	Refer to illustration of the eye. Describe its parts and how they function to permit sight and protect the eye.
	2. **The eye as a vital sign.** Pupils can be: a. Dilated b. Constricted c. Unequal d. Fixed	Ask class member how he would interpret the pupil sizes. Note that EMT should be alert for glass eyes.
	3. **Injuries** a. ***Signs*** 1) Swollen or lacerated eyelids 2) Bloodshot eyes 3) Scratched cornea	
	b. ***Foreign bodies*** 1) Small foreign bodies can be removed by a cotton-tipped applicator. Small bodies on the cornea should not be removed.	Display applicator and describe procedures.
	2) Impaled objects are not removed. Eye should be covered with a paper cup/cone or eye shield and bandaged. Both eyes should be covered to minimize movement.	Demonstrate on student.
	c. ***Burns*** 1) *Chemical burns*—the eye should be copiously flushed with water before bandaging. 2) *Burned eyelids*—the eye should be covered with a sterile moist dressing. 3) *Light burns*—the eye should be covered with a sterile moist dressing.	Describe causes, pain and seriousness of each burn types.
	d. ***Lacerations and contusions***—pressure may be applied except **never** to the eyeball itself.	Refer to illustration of lacerated eye.
	e. ***Extruded eyeball***—the eye should be gently covered with a moist dressing; do **not** replace eyeball.	Refer to illustration of extruded eyeball.
	f. ***Blunt trauma***—eye should be covered	Describe causes and signs.

Time (Elapsed) Actual	Contents	Instructor Notes
The Chest (0:40) 0:10	1. **Design**	Refer to illustration of thorax and ask class to identify skeletal parts and organs. Refer to torso with removable organs.
	a. The rib cage includes the ribs, the thoracic vertebrae, and the sternum.	
	b. The ribs are connected to the vertebrae in back and all but two are connected to the sternum in front by cartilage.	
	c. There is some movement of the rib cage associated with breathing.	
	d. The rib cage encloses the lungs and heart, and damage to the ribs can result in damage to these organs.	Describe causes and effects of open and closed wounds.
	2. **Injuries**	
	a. ***Signs***	List on chalkboard. Discuss reasons for the signs.
	1) Pain at the site of injury	
	2) Pain with breathing	
	3) Dyspnea	
	4) Failure of one or both sides of chest to expand normally with inspiration	
	5) Coughing up blood	
	6) Rapid weak pulse and low blood pressure	
	7) Cyanosis	
	3. **General principles of care.** Major concern is to control bleeding and maintain breathing and adequate oxygen.	
Ten-Minute Break (0:50) 0:10		
The Chest (Continued) (1:00) 0:30	4. **Types of injuries.** Injuries to the chest include rib fractures, penetrating injuries, and injuries to the internal chest organs (heart and lungs). All, of course, may occur together.	
	a. ***Rib fractures***	
	1) Common finding is localized pain.	Identify other possible signs, e.g., patient may lean toward injured side.
	2) Simple fractures should not be bound, strapped or taped.	
	3) With multiple fractures, the patient may be more comfortable with the arm strapped to the chest with a swathe.	Demonstrate on student. Explain why adhesive plaster should not be used.
	b. ***Flail chest***	
	1) When each of three or more ribs is broken in two places, the resultant portion will not move with the rest of the rib cage when the patient attempts to breathe.	Refer to illustration of a flail chest.
	2) Immobilizing the rib may improve respirations.	Emphasize seriousness of the condition.
	3) The EMT should be prepared to use resuscitative measures.	
	c. ***Penetrating wounds***	
	1) These consist of open chest wounds in which the chest wall is torn—typically by a foreign object.	
	2) The wound must be closed quickly since it can result in air outside the lung in the chest cavity.	

Time (Elapsed) Actual	Contents	Instructor Notes
	3) They may cause sucking chest wounds, rib fractures or laceration of the heart or blood vessels of the chest.	
	d. ***Compression injuries.*** Compression can increase intrathoracic pressure, cause rib fractures, a flail chest, and traumatic asphyxia.	
	e. ***Injuries to the back of the chest.*** Major concern is spine injury. Other than fractures, the are usually muscle strains and lacerations	
	5. **Results of chest injuries**	
	a. ***Pneumothorax***—air enters the chest cavity through a sucking wound or leaks from a lacerated lung. The lung cannot expand.	List on chalkboard. Discuss causes, signs, dangers and techniques of care for each condition. Emphasize need for sealing wounds, providing respiratory support, monitoring vital signs and prompt transportation.
	b. ***Spontaneous pneumothorax***—air leaks into the chest from a congenitally weak area in the lung surface and the lung collapses.	
	c. ***Tension pneumothorax***—air continuously leaks out and the lung collapses completely. Pressure rises and the collapsed lung is forced against the heart and other lung. The tension must be relieved by a hypodermic needle. Release of a bandage on a chest wound may be effective.	
	d. ***Hemothorax***—blood leaks into the chest cavity from lacerated vessels or the lung itself and the lung compresses.	
	e. ***Sucking chest wounds***—air enters the chest cavity through an open wound. The wound must be closed immediately with an air-tight dressing. Aluminum foil, plastic wrap or any dressing may be used.	Explain how pressure in the chest changes. Demonstrate sealing a sucking chest wound with an occlusive dressing.
	f. ***Subcutaneous emphysema***—a fractured rib has fractured a lung. A crackling sensation is felt under the fingertips as one feels over the area of the fracture.	
	g. ***Traumatic asphyxia***—severe compression puts pressure on heart and forces blood back into veins of the neck. It may also cause severe lung damage. This is a severe emergency.	
	h. ***Pericardial tamponade***—blood or other fluid in the pericardial sac outside the heart exerts pressure on the heart.	
	i. ***Lacerations of the great vessels***—a major blood vessel is torn.	
	j. ***Traumatic emphysema***—a sudden compression injury occurs when the glottis is closed; air sacs are ruptured and leak air.	
The Abdomen and Genitalia (1:30) 0:30	1. **The abdominal cavity**	Refer to illustration of abdominal cavity and describe its design.
	a. Contents—major organs of digestion, excretion, female reproduction	
	b. Boundaries	
	c. Peritoneum and mesentery	
	2. **Digestive system**	Refer to illustration of digestive system, identify contents, general design and function. Refer to torso with removable organs.
	a. Function	
	b. Location—transcends boundaries of thorax and abdomen	

Time (Elapsed) Actual	Contents	Instructor Notes
	c. Contents	
	1) Mouth	
	2) Salivary glands	
	3) Pharynx	
	4) Esophagus	
	5) Stomach	
	6) Pancreas	
	7) Liver	
	8) Gallbladder and bile ducts	
	9) Small intestine	
	10) Large intestine	
	11) Appendix	
	12) Rectum and anus	
	d. Spleen	
	e. Peristalsis	
	3. **Urinary system**	Refer to illustration of urinary system, identify contents, general design and function.
	a. Functions	
	b. Contents	
	1) Kidneys	
	2) Ureter	
	3) Urinary bladder and urethra	
	4. **Reproductive system**	
	a. Male	Refer to illustrations of male and female reproductive systems, identify contents, general design and function.
	1) Testicles	
	2) Vasa deferentia	
	3) Seminal vesicles	
	4) Prostate gland	
	5) Urethra	
	6) Penis	
	b. Female	
	1) Ovaries	
	2) Fallopian tubes	
	3) Uterus	
	4) Vagina	
	5. **Injuries to the abdomen**	
	a. ***Types.*** Injuries may be open or closed.	
	b. ***Hollow and solid organs.*** Abdomen contains both hollow and solid organs.	
	1) Rupture of hollow organs (organs of the digestive system) spills contents into the peritoneal cavity causing inflammatory reaction.	Give examples.
	2) Rupture of solid organ (that is, the liver) may result in severe bleeding.	Give examples.
	3) Closed or open wounds may involve major blood vessels and be quickly fatal.	
	c. ***Signs***	
	1) Patient will be still, usually with legs drawn up.	Give reason for each sign.
	2) Breathing will be rapid and shallow.	Indicate that abdomen may

Time (Elapsed) Actual	Contents	Instructor Notes
	3) Skin wounds and penetrations may be evident.	be rigid and tender. There
	4) Pulse may be rapid and blood pressure low.	may be referred pain.
	5) Patient may be nauseated and may vomit.	
	6) Organs may protrude.	Refer to illustration of
	7) Fractures may be evident.	protruding abdominal
	8) There may be blood in the urine.	organs.
	Note: Describe special dangers associated with safety belt injuries.	
	d. ***Emergency care***	
	1) For all abdominal injuries, suspect shock and work to prevent it.	
	2) Constantly monitor and evaluate vital signs.	
	3) Be alert for vomitus.	
	4) Do not remove penetrating objects.	
	5) Do not touch protruding organs. Cover them with a sterile dressing and keep the dressing moist.	
	6. **Injuries to external male genitalia**	
	a. ***Types.*** As with injuries to other body parts, there may be bruises, lacerations, penetrating objects and avulsions.	
	b. ***Care.*** Emergency care rules are essentially the same as those for all other bodily injuries, that is:	
	1) Control bleeding by direct pressure.	
	2) Cover with moist compresses.	
	3) Do not remove penetrating objects.	
	4) Preserve avulsed parts.	
	7. **Injuries to internal female genitalia.** These organs are rarely injured except in the pregnant female. Blunt injuries may rupture the uterus, cause loss of life of the fetus and severe hemorrhage and peritonitis.	
	8. **Injuries to external female genitalia.** The types and care for these injuries are similar to those of injries to other body parts and emergency care is the same. Nothing should be placed in the vagina.	Ask a class member to review emergency care for injuries.
Practice (2:00) 1:00	1. Working in pairs, each student should practice dressing and bandaging:	Divide class into groups of 6. Provide a 10-minute break during the practice period. Monitor and critique each student. Permit students to practice until they can perform without error.
	a. A lacerated eye with a protruding object	
	b. A sucking chest wound with multiple rib fractures.	
	2. Working on a fellow student, the student should perform a survey for life-threatening problems and a systematic survey for injuries. He should explain what he is doing, what he finds and the action he would take.	
	Note: The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	*Note:* The instructor may wish to describe the initial patient condition and interject findings as the examination progresses.
(3:00)	*Note:* Students should be reminded that the next two lessons are practice, test and evaluation lessons.	

Lesson 12

Practice, Test and Evaluation— Injuries I

Objectives

Administer a written test to evaluate student attainment of the knowledge objectives specified for Lessons 7 through 11.

Permit the student to practice skills in dressing and bandaging various body parts and in performing a patient examination.

Evaluate student attainment of the skill objectives specified in Lessons 7 and 11 for dressing and bandaging various body parts and performing a patient examination.

Requirements

Equipment/material:

Written test covering topic area (one for each student)

Checklist (one for each student for each skill included in the evaluation session)

Universal dressing (one for each two students)

Gauze pad (one for each two students)

Roller bandage (one for each two students)

Occlusive dressing (one for each 6 students)

Triangular bandage (one for each two students)

Paper cup/cone or eye shield (one for each 6 students)

Bandage shears (one for each 6 students)

Adhesive tape (one for each 6 students)

Instructors:

One for each 6 students during the evaluation session.

Note: It is recommended that this lesson include three or four additional instructor aides to serve as victims during the evaluation of the skill of patient examination. Each victim should simulate a different emergency problem.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for this lesson.

Instructor Tasks

1. **Evaluation of knowledge objectives**

It is assumed that instructors for individual lessons will assist the course coordinator in developing written test items for the lessons they teach. It will be the responsibility of the course coordinator to assemble a balanced test that is directed toward assessing whether or not the knowledge objectives of Lessons 7 through 11 have been achieved.

The instructor for the first part of this lesson serves largely as a monitor of the test itself. He should assure that he has sufficient copies of the test for each student and should review all procedures for completing the test so that he can explain these procedures correctly to the students.

2. **Evaluation of skill objectives**

In order to assure that all students are evaluated in the same manner, the instructor should have a checklist on which he can check off the principal features of the skill to be evaluated. This checklist essentially comprises the student's evaluation sheet. It is assumed that the checklist will be prepared by the instructor and course coordinator. To aid in designing checklists, the lesson plan identifies certain

features of each skill. These may be refined into a list of steps. The resultant steps may not all be of equal weight in skill evaluation. The primary purpose of the checklist is to aid instructors in **standardizing** their evaluations of student performance. All instructors must be briefed on checklist use.

Detailed procedures are not specified for the lesson since they will vary depending on the number of students in the class, the number of instructors and the amount of material available. It is suggested that the instructors divide among themselves the skills to be evaluated. In effect, the lead instructor should set up test stations. He should also assure that all materials required for the lesson are available.

All instructors should be thoroughly briefed on their responsibilities. Each instructor should review the lesson plans and references for Lessons 7 and 11 so that they are thoroughly knowledgeable about their contents.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (--) 0:05	1. Student attendance 2. Announcements Etc.	
Evaluation of Knowledge Objectives (0:05) 0:30	1. Student completion of written test designed to evaluate attainment of knowledge objectives specified for Lessons 7 through 11.	Distribute test. Explain procedures for taking test. Collect completed papers.
Ten-Minute Break (0:35) 0:10		
Practice and Evaluation of Skill Objectives—Bandaging (0:45) 2:15	1. **Practice.** Working in pairs, each student should be permitted to practice each skill until he feels prepared to be evaluated on that skill. 2. **Evaluation.** The instructor should use a checklist to evaluate student proficiency in applying a dressing and bandage to the following body parts: a. Top of the head b. Ear c. Cheek d. Eye with protruding eyeball e. Neck f. Shoulder or hip g. Sucking wound of the chest with multiple rib fractures h. Lower arm or leg i. Knee or elbow j. Jaw Performance should include: a. Selecting the appropriate dressing and bandage b. Handling the dressing in an aseptic manner c. Providing sufficient coverage of the wound d. Securing the bandage firmly e. Assuring that there are no loose ends f. Checking circulation distal to the wound as appropriate	Explain procedures to be followed in the practice and evaluation session.

Time (Elapsed) Actual	Contents	Instructor Notes
Practice and Evaluation of Skill Objectives—Patient Examination	1. **Practice.** Working in pairs, each student should be permitted to practice performing an examination for life-threatening emergencies and injuries until he feels prepared to be evaluated.	
	2. **Evaluation.** Working on simulated victims, each student should make a thorough patient examination. His performance should include: a) performing a life-threatening survey and taking appropriate actions for any life-threatening problems, and b) performing a systematic check for injuries, describing what he finds and what he would do to care for the patient. The examination should include:	Rotate student through the victims' stations so that each student examines each victim.
	a. Life-threatening survey 1) Establishing responsiveness 2) Checking respirations 3) Checking pulse 4) Checking for bleeding and shock	
	b. Survey of injuries 1) Checking head 2) Checking eyes, ears, nose, mouth 3) Checking neck 4) Checking upper extremities 5) Checking chest 6) Checking back and buttocks 7) Checking abdomen and pelvis 8) Checking lower extremities 9) Checking for medical alert symbols	
	c. Rapport with conscious patient 1) Identifying self 2) Obtaining and using patient's name 3) Explaining movements and procedures 4) Reassuring patient	
(3:00)		

Lesson 13

Practice, Test and Evaluation— Injuries II

Objectives

Permit the student to practice skills in immobilizing fractures and dislocations of the upper and lower extremity

Evaluate student attainment of the skill objectives specified in Lessons 8 and 9 for immobilizing fractures and dislocations of the upper and lower extremity

Requirements

Equipment/material:

Checklist (one for each student for each skill included in the evaluation session)

Rigid splint (one set for each two students)

Traction splint (one for each three students)

Long board splint (one set for each three students)

Air splint (one for each 6 students)

Triangular bandages (four for each two students)

Blanket (one for each two students)

Pillow (one for each two students)

Instructors:

One for each 6 students.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for this lesson.

Instructor Tasks

In order to assure that all students are evaluated in the same manner, the instructor should have a checklist on which he can check off the principal features of the skill to be evaluated. This checklist essentially comprises the student's evaluation sheet. It is assumed that the checklist will be prepared by the instructor and course coordinator. In view of the variety of equipment involved, features of the skill are not identified in the lesson plan. Steps in performing each skill will need to not be all of equal weight in skill evaluation. The primary purpose of the checklist is to aid instructors in **standardizing** their evaluations of student performance. All instructors must be briefed on checklist use.

Detailed procedures are not specified for the lesson since they will vary depending on the number of students in the class, the number of instructors and the amount of material available. It is suggested that the instructors divide among themselves the skills to be evaluated. In effect, the lead instructor should set up test stations. He should also assure that all materials required for the lesson are available.

All instructors should be thoroughly briefed on their responsibilities. Needless to say, each instructor should review the lesson plans and references for Lessons 8 and 9 so that they are thoroughly knowledgeable about their contents.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	
Practice and Evaluation of Skill Objectives (0:05) 2:25	1. **Practice.** Working in groups of two or three as appropriate, each student should be permitted to practice each skill until he feels prepared to be evaluated on that skill. 2. **Evaluation.** The instructor should use a checklist to evaluate student proficiency in immobilizing the following fractures and dislocations: a. Fracture of the clavicle using a sling b. Dislocation of the shoulder using a blanket, sling and swathe c. Fracture of the humerus using a rigid splint d. Fracture of the elbow using a rigid splint e. Fracture of the ulna using a rigid or air splint f. Fracture of the hip using a pillow and blanket g. Fracture of the femur using a traction splint h. Fracture of the femur using a long board splint i. Dislocation of the knee using an air splint j. Fracture of the ankle using a rigid splint k. Fracture of the foot using a pillow splint	Explain procedures to be followed in the practice and evaluation session.
(2:30)		

Lesson 14

Medical Emergencies I

Objectives

Review student performance during the previous two practice, test and evaluation sessions

Provide the student with sufficient information for him to describe the causes, signs and emergency care for the following:

Poisons—ingested and inhaled

Bites and stings

Heart attack

Stroke

Dyspnea

Provide student with practice in assessing a patient's condition and providing (or describing as appropriate) proper emergency care.

Permit the student to practice **as needed** the following skills:

Cardiopulmonary resuscitation

Use of mechanical aids to airway care and resuscitation

Requirements

Equipment/material:

Adult resuscitation manikin (one for each 6 students)

Infant resuscitation manikin (one for each 6 students)

Oropharyngeal airways (one set for each 6 students)

Nasopharyngeal airways (one set for each 6 students)

Portable suction unit (one for each 6 students)

Oxygen equipment (cylinder, pressure regulator, flowmeter, humidifier) (one for each 6 students)

Nasal cannula (one for each 6 students)

Mask and bag (one set for each 6 students)

Venturi mask (one set for each 6 students)

Pocket mask with oxygen inlet valve (one set for each 6 students)

Bag-valve-mask system (one set for each 6 students)

Note: Where appropriate, adult, child and infant sizes of equipment should be available.

Illustrations (chart, slide, drawing):

Black widow spider

Brown recluse spider

Pit viper

Coral snake

Myocardial infarction

Instructors:

One for each 6 students during practice period.

The instructor for the review portion of this lesson should be an individual knowledgeable about the previous practice, test and evaluation session.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Check with the Poison Control Center to make sure that emergency care procedures for poisons are up-to-date.
4. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.
5. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.
6. Assure that all equipment and materials required for the lesson are available.
7. Brief all instructor aides regarding their roles and responsibilities during the lesson.
8. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.

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[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 30, 31, 33 and 45.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	*Note:* The review portion of the lesson should be conducted by an individual knowledgeable about the previous practice, test and evaluation session.
Review of Previous Lesson (0:05) 0:20	1. Written test—correct answers and common errors made in the written test administered in the previous lesson. 2. Practical examination—overall class performance and common errors made in demonstration of skills in the previous lesson.	Distribute student tests. Review test pointing out correct answers and discussing common errors. Review overall performance and discuss types of errors made by class members.
Introduction (0:25) 0:05	1. **Lesson coverage.** This lesson provides for the following: a. Review of the two preceding practice, test and evaluation lessons. b. Causes, signs and emergency care for poisons, bites and stings, heart attack, stroke and dyspnea. c. Additional practice on mechanical aids to airway care and CPR. 2. **Need for lesson.** This lesson covers common medical conditions; severe cases can be life-threatening. The EMT should be able to recognize these conditions and render appropriate emergency care. 3. **Lesson objectives** a. Review student performance during the previous two practice, test and evaluation sessions. b. Describe the causes, signs and emergency care for the following: 1) Poisons—ingested and inhaled 2) Bites and stings 3) Heart attack 4) Stroke 5) Dyspnea c. Practice as needed the following skills: 1) Cardiopulmonary resuscitation 2) Use of mechanical aids to airway care and resuscitation	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered. Refer to lesson objectives in the Student Study Guide and review with class.
Ingested Poisons (0:30) 0:10	1. **Signs.** Signs are variable depending on the substances. There may be burns, odors or stains about the mouth. Other common signs include: a. Nausea/vomiting b. Abdominal pain c. Diarrhea d. Dilation or constriction of pupils	If new instructor, introduce self and instructor aides. Indicate typical causes. Note that alcohol and drugs will be covered in the next lesson.

Time (Elapsed) Actual	Contents	Instructor Notes
	e. Excessive salivation or sweating	
	f. Abnormal respiration	
	g. Unconsciousness	
	h. Convulsions	
	2. **Emergency care**	
	a. The best treatment is to dilute the substance and induce vomiting.	Follow latest recommendations of local Poison Control Center.
	b. Vomiting should **not** be induced when:	
	1) Strong acids or alkalis are swallowed—they injure the esophagus when swallowed and will reinjure it if regurgitated.	
	2) Petroleum products are swallowed—a serious pneumonia could result if aspirated into the lungs.	
	3) Patient is not fully conscious or is convulsing—he might aspirate vomitus into the lungs.	
	c. Dilution is accomplished with milk or water.	Explain procedures.
	d. Vomiting is typically induced with syrup of ipecac.	Explain procedures.
	e. Activated charcoal may be a helpful absorbent.	Describe its action and use with syrup of ipecac.
	f. Soothing agents help to decrease gastrointestinal irritation.	Identify agents.
	g. The poisonous substance should be located, if possible, and the Poison Control Center contacted to determine the most effective procedure.	Give name, address and telephone number of local Poison Control Center.
	h. Poisonous plants can cause severe reactions ranging from gastrointestinal disturbances to nervous system disorders and circulatory collapse. There are no antidotes for plant poisons. Severe cases need basic life support and speedy transport.	Emphasize importance of preserving evidence including vomitus. Identify some typical poisonous plants and their reactions.
Inhaled Poisons	1. For inhaled poisons, such as carbon monoxide, the major concern is removing the patient from the source.	
	2. Oxygen and cardiopulmonary resuscitation should be administered as required.	
Bites and Stings (0:40) 0:10	1. **Bees, wasps, ants**	
	a. The major danger arises when the person has a hypersensitive reaction.	Ask a class member to describe the signs and care for anaphylactic shock.
	b. These reactions were discussed previously under the heading "anaphylactic shock."	
	c. In addition to basic life support, the following should be done:	
	1) Place a constricting band above an injury in an extremity.	Give reason.
	2) If present, carefully scrape stinger and venom sac [illegible]	
	3) Place an ice pack over the bitten area.	Give reason.
	2. **Spiders**	
	a. Death has rarely been reported.	Describe typical signs.

Time (Elapsed) Actual	Contents	Instructor Notes
	b. Severe cases should receive basic life support, application of a cold pack to the bite and immediate transport.	
	c. Antivenins are available for black widow and brown recluse spider bites, and identification of the insect is important.	Refer to illustration of black widow and brown recluse spiders and describe distinguishing features.
	3. **Snakes**	
	a. Venomous species include the pit viper (rattlesnake, cottonmouth and copperhead) and coral shake. Coral snake is especially dangerous since it affects the central nervous system.	Refer to illustrations of pit vipers and coral snakes and describe distinguishing features.
	b. Emergency care for pit viper bites:	Describe typical signs.
	1) Calm patient.	
	2) Cleanse wound.	
	3) Wrap soft rubber tubing about the extremity above and below fang marks to occlude **only** superficial venous flow.	
	4) Splint the extremity.	
	5) Check vital signs.	
	6) Prevent shock.	
	7) Apply ice pack to the wound if directed by a physician.	
	8) Incise wound and massage or suction with a cup only **if** wound occurred within previous 30 minutes, **if** patient shows signs of envenomation, and **if** directed to do so by a physician.	Explain.
	c. Emergency care for coral snake is identical except that the constricting band is placed above the wound only and incisions and suction are not recommended.	Describe typical signs.
Ten-Minute Break (0:50) 0:10		
Heart Attack (1:00) 0:20	i. **Cardiac function**	
	a. The heart is a muscle and, like all muscles in the body, is supplied with arteries.	
	b. Arteriosclerosis is a disease process that can damage coronary arteries. It lays down deposits of fat which progressively narrow the artery.	
	c. When an artery becomes blocked, that part of the muscle which it serves dies and the patient has what is known as a heart attack, or myocardial infarction.	Refer to illustration of a myocardial infarction.
	d. The heart will still continue to pump even though part of the muscle dies. However, the attack usually occurs in the left ventricle which may be unable to pump all blood coming from the lungs. Fluid may accumulate in the lungs—a condition known as pulmonary edema.	Review how the ventricles function.
	e. If too much muscle is lost, shock and sudden death will result.	

Time (Elapsed) Actual	Contents	Instructor Notes
	2. Myocardial infarction	
	a. ***Signs.*** An acute myocardial infarction may have the following signs:	List on chalkboard.
	1) Sudden onset of weakness, nausea and sweating without a clear cause.	
	2) Pain—usually described as squeezing. It is substernal and perceived as radiating to the jaw, left arm or both arms. It is unrelated to exertion and not relieved by rest.	Indicate that pain lasts 30 minutes to hours.
	3) Arrhythmia and fainting.	Note that fainting or pulmonary edema may be the first signs.
	4) Pulmonary edema.	
	5) Sudden death.	
	b. ***Physical findings***	
	1) Pulse usually increases.	Note that occasionally the pulse slows.
	2) Blood pressure falls.	
	3) Respirations are normal unless pulmonary edema develops; then respirations are rapid and shallow.	
	4) Patient appears frightened and may be sweaty and pale gray in color.	
	c. ***Emergency care***	
	1) Obviously, for cardiac arrest, CPR is performed.	
	2) For patients suspected of having a heart attack:	
	a) Place the patient in a semi-reclining position.	
	b) Administer oxygen by face mask.	
	c) Do not allow the patient to assist in moving himself.	
	d) Comfort and reassure patient.	
	e) Loosen patient's clothing.	
	3. Angina pectoris	
	a. ***Definition.*** Angina is pain which occurs when the heart needs more oxygen than is available. It is usually brought on by stress or unusual effort.	
	b. ***Signs.*** The patient suffers pain in the chest; it radiates to the jaw or arms. It is felt as a pressure or squeezing sensation.	
	c. ***Emergency care***	
	1) Patients are usually aware of their condition and have been given medication (nitroglycerine) by their physician to relieve the pain—assist them in taking any prescribed medication.	
	2) It is usually relieved by rest and lasts 3 to 8 minutes and rarely longer than 10 minutes.	
	4. Congestive heart failure	
	a. ***Definition.*** When the heart does not pump blood efficiently to the body, fresh blood cannot enter the heart from the lungs. Blood and other fluids accumulate in the lungs.	Ask student to identify resultant condition.
	b. ***Signs.*** Signs include the following:	
	1) Shortness of breath	
	2) Anxiety	
	3) Rapid heart rate	
	4) Rales or wheezing sounds	
	5) Normal or somewhat high blood pressure	
	Note: It is possible to have heart failure with no chest pain.	

Time (Elapsed) Actual	Contents	Instructor Notes
	c. ***Emergency care.*** Emergency care for this patient is the same as that for heart attack patients.	
Stroke (1:20) 0:15	1. **CVA.** A stroke is also known as a cerebrovascular accident of CVA; it is an interruption of blood flow long enough to cause damage to the brain.	
	2. **Causes.** Part of the brain has been damaged due to a blood clot or rupture of an artery. A clot may have formed elsewhere in the body and traveled to the brain as an embolus.	
	3. **Signs** a. Numbness or paralysis of the extremities. b. Confusion or dizziness. c. Difficulty with speech or vision. d. Diminished consciousness; coma. e. Convulsions. f. Headache alone.	
	4. **Emergency care.** Care will depend on the signs exhibited by the particular patient. Major consideration is calm treatment and careful handling, particularly of paralyzed parts. *Note:* Even though the patient may not be able to speak and appears unconscious, he may be able to hear what is being said—be careful what you say in front of such patients.	Identify types of care that may be required for stroke patients.
Dyspnea (1:35) 0:15	1. **Definition.** It is defined as a **sensation** of shortness of breath.	
	2. **Causes.** Causes may be medical or traumatic. Traumatic causes have been previously covered in the lesson on chest injuries.	
	3. **Medical reasons.** Medical problems include: a. Acute pulmonary edema—discussed under heart attack. b. Airway obstruction by aspiration of vomitus or foreign objects—discussed previously. c. Pulmonary diseases: 1) Chronic obstructive lung disease (emphysema or chronic bronchitis). 2) Asthma or allergic reactions. d. Hyperventilation	
	4. **Stimulus to breathing** a. Main stimulus—level of carbon dioxide in the arterial blood. b. Secondary stimulus—low level of oxygen in the arterial blood.	Explain how the main stimulus works and when the secondary stimulus takes over.

Time (Elapsed) Actual	Contents	Instructor Notes
	5. Chronic obstructive lung disease	
	a. ***Cause.*** Severe pulmonary damage—respiratory center may be so depressed that the patient does not have a stimulus to breathe.	Give typical reasons for the condition.
	b. ***Signs***	
	1) Typically elderly thin patient with barrel-like chest.	
	2) Semiconscious or unconscious.	
	3) Respiratory distress—rapid or slow.	
	4) Using muscles of neck and shoulders to expand chest.	
	5) Pursing lips to puff air out.	
	6) Pulse rapid, possibly irregular.	
	c. ***Emergency care***	
	1) Reassure patient.	
	2) Administer oxygen.	Repeatedly evaluate respirations.
	3) Assist breathing as necessary.	
	6. Bronchial asthma	
	a. ***Cause***—abnormal spasm of the airway passages; patient is normal between attacks.	
	b. ***Signs***	
	1) Respiratory distress—wheezing on expiration; difficult expiration; increased respiratory rate.	
	2) Tension and anxiety.	
	3) Blood pressure possibly slightly elevated.	
	c. ***Emergency care***	
	1) Reassure patient.	
	2) Administer oxygen.	
	3) Assist patient in taking his own medication.	
	7. Hyperventilation	
	a. ***Cause***—overbreathing usually due to psychological stress.	Explain how a person can hyperventilate.
	b. ***Signs***	
	1) Anxiety—terrified of death.	
	2) Dizziness and fainting.	
	3) Numbness or tingling of hands and feets.	
	4) Stabbing chest pain.	
	5) Rapid breathing.	
	6) High pulse rate.	
	c. ***Emergency care***	
	1) Reassure patient.	
	2) Ask patient to breathe into paper bag.	
Ten-Minute Break (1:50) 0:10		
Practice (2:00) 1:00	1. Symptom recognition and emergency care for:	Simulate signs and symptoms. Ask student to
	a. Ingested poison	

Time (Elapsed) Actual	Contents	Instructor Notes
	b. Snake bite c. Heart attack d. Stroke e. Anaphylactic shock f. Acute emphysema attack g. Acute asthmatic attack	assess the condition and provide or describe emergency care. The student should demonstrate his approach to the patient and history taking as appropriate.
	2. Each student should practice **as needed** the following skills:	Divide class into groups of 6.
	a. Performing one-man cardiopulmonary resuscitation on an adult manikin for both a witnessed and unwitnessed cardiac arrest.	
	b. Performing two-man cardiopulmonary resuscitation including changing positions during resuscitation.	
	c. Performing cardiopulmonary resuscitation while manikin is being transported on a stretcher.	
	d. Performing cardiopulmonary resuscitation on an infant manikin.	
	e. Using the following equipment (including setting up and closing down equipment as appropriate):	
	1) Oropharyngeal airways.	
	2) Nasopharyngeal airways.	
	3) Portable suction unit.	
	4) Oxygen.	
	5) Oxygen delivery system—nasal cannula, facemasks, mask and bag, and/or venturi mask.	
	6) Pocket mask with oxygen inlet valve.	
	7) Bag-valve-mask resuscitator with and without oxygen.	
(3:00)		

Lesson 15

Medical Emergencies II

Objectives

Provide the student with sufficient information for him to describe the causes, signs, and emergency care for the following:

Diabetic coma and insulin shock

Acute abdomen

Communicable diseases

Patients with abnormal behavior

Alcohol and drug abuse

Epileptic convulsion

Review problems in dealing with child patients.

Provide the student with practice in assessing a patient's condition and providing (or describing as appropriate) proper emergency care.

Requirements

There are no special requirements for this lesson.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.
4. Be prepared to use chalkboard in class.
5. Formal evaluation of skills and knowledge will be accomplished in subsequent lessons.
6. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

[1]The contents of this lesson were based on the following references:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition), Chicago, Illinois, 1977. Chapters 27, 32, 34, 35, 37, 38 and 39.

The American National Red Cross. **Drugs and their abuse.** 1971.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self.
Introduction (0:05) 0:05	1. **Lesson coverage.** The lesson discusses the causes, signs and emergency care for diabetic conditions, the acute abdomen, communicable diseases, the disturbed and unruly, alcohol and drug abuse and epilepsy. It also reviews common problems and techniques of care for the child patient. 2. **Need for lesson.** This lesson covers common medical conditions; severe cases can be life-threatening. The EMT should be able to recognize these conditions and render appropriate emergency care. 3. **Lesson objectives** a. Describe the causes, signs, and emergency care for the following: 1) Diabetic coma and insulin shock 2) Acute abdomen 3) Communicable diseases 4) Emotionally disturbed 5) Alcohol and drug abuse 6) Epileptic convulsion b. Review special techniques and problems in dealing with child patients.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered. Refer to lesson objectives in the Student Study Guide and review with class.
Diabetes (0:10) 0:15	1. **The condition** a. Diabetes is a condition in which the body is unable to use sugar normally. b. Body cells need sugar to survive. c. Insulin in the body permits sugar to pass from the bloodstream to body cells. d. If there is not enough insulin, sugar will be unable to get to body cells and they will starve. e. If there is too much insulin, there will be insufficient sugar in the bloodstream and brain cells will be damaged since they need a constant supply of sugar. 2. **Diabetic coma** a. ***Problem.*** There is insufficient insulin and therefore too much sugar in the blood and not enough in the body cells. The diabetic: 1) Has eaten too much food that contains or produces sugar, or 2) Has not taken his insulin. b. ***Signs.*** The diabetic may have some or all of the following signs: 1) A sweet or fruity (acetone) odor.	Discuss importance of checking for emergency medical identification symbol. List on chalkboard.

Time (Elapsed) Actual	Contents	Instructor Notes
	2) Dehydrated (dry) warm skin.	
	3) Rapid, weak pulse.	
	4) Air hunger—rapid, deep breathing.	
	5) Varying degrees of unresponsiveness, up to coma.	
	6) Normal or slightly low blood pressure.	
	Note: The onset of diabetic coma is gradual over a period of days.	
	c. ***Emergency care.*** This patient needs immediate transportation to a medical facility.	
	3. **Insulin shock**	
	a. ***Problem.*** There is too much insulin in the body; therefore, the sugar leaves the blood rapidly and there is insufficient sugar for the brain cells. The diabetic:	
	1) Has taken too much insulin, or	
	2) Has not eaten enough food, or	
	3) Has exercised excessively.	
	b. ***Signs.*** Signs include the following:	List on chalkboard. Discuss difficulty of diagnosis.
	1) Pale, moist skin.	
	2) Full, rapid pulse.	
	3) Normal breathing.	
	4) Dizziness; headache.	
	5) Fainting; seizures; disorientation; coma.	
	6) Normal blood pressure.	
	Note: The onset of insulin shock is sudden; it may occur within minutes.	
	c. ***Emergency care.*** The patient desperately needs sugar before brain damage and death occur. A sugar cube placed under the tongue of an unconscious patient should arouse him; sugar in any form can be given to a conscious patient. He needs immediate transportation to a medical facility.	Note that the unconscious patient needs constant observation if sugar is placed under the tongue.
	Note: If the rescuer can't distinguish between diabetic coma and insulin shock and sugar is available, have the patient take it. It can't appreciably hurt the patient in diabetic coma and may save the life of a patient in insulin shock.	
Acute Abdomen (0:25) 0:10	1. **Definition.** The term means abdominal disease causing irritation or inflammation of the peritoneum.	Identify typical causes.
	2. **Signs**	
	a. Abdominal pain, local or diffuse	Explain reason for each sign.
	b. Abdominal tenderness, local or diffuse	
	c. Patient is quiet and reluctant to move	
	d. Rapid shallow breathing	
	e. Rapid pulse	
	f. Low blood pressure	
	g. Tense, often distended, stomach	
	h. Position of the patient	

Time (Elapsed) Actual	Contents	Instructor Notes
	Note: If peritonitis is associated with hemorrhage, signs of shock may be severe.	
	3. **Emergency care.** The patient needs speedy transportation to a medical facility. Care includes:	Emphasize importance of recording signs and symptoms and patient's description of his condition.
	a. Keep airway clear	
	b. Administer oxygen if necessary	
	c. No liquids or food	
	d. No medication	
	e. Position patient comfortably	
	f. Prevent shock	
Communicable Diseases (0:35) 0:15	1. **Common communicable diseases**	**Briefly** describe typical characteristics and mode of transmission of **some** of the common communicable diseases.
	a. Chicken pox	
	b. Diphtheria	
	c. Food poisoning	
	d. German measles	
	e. Gonorrhea	
	g. Malaria	
	h. Measles	
	i. Meningitis	
	j. Mononucleosis	
	k. Mumps	
	l. Pneumonia	
	m. Poliomyelitis	
	n. Rocky Mountain spotted fever	
	o. Smallpox	
	p. Scariet fever	
	q. Syphilis	
	r. Tuberculosis	
	s. Typhoid fever	
	t. Whooping cough	
	2. **Procedures**	
	a. If nature of call is known in advance:	
	1) Wear disposable gown and mask.	
	2) Remove all unnecessary equipment from the vehicle.	
	3) Use as much disposable equipment as possible.	Identify types of equipment.
	b. Upon return:	
	1) Boil clothing	
	2) Wash hands	
	3) Shower	
	4) If exposed to:	Follow latest medical recommendations.
	a. Small pox - revaccination	
	b. Diphtheria - immunization	
	c. Meningitis - check with physician	

Time (Elapsed) Actual	Contents	Instructor Notes
	d. Syphilis - check with physician if bitten or scratched	
	c. Follow prescribed procedures for sanitizing and decontaminating the vehicle and its equipment.	Review procedures.
	Note: The EMT should protect himself by having yearly physicals and making sure his vaccinations are up to date.	
Ten-Minute Break (0:50) 0:10		
Patients with Abnormal Behavior (1:00) 0:05	1. **Reasons for abnormal behavior**	
	a. Emotional stress may result from the crisis at hand. The patient, relatives and bystanders may become hysterical. The patient may be afraid of dying.	
	b. Injuries, such as a blow to the head, may result in abnormal behavior.	
	c. Illnesses, such as diabetes, high blood pressure, epilepsy and high fevers, can result in abnormal behavior.	
	d. Persons with mental disorders may be violent, agitated, threatening, or they may be depressed or suicidal.	
	e. Persons under the influence of alcohol may be unruly. A person undergoing sudden alcohol withdrawal may have hallucinations or delirium tremens (DT's).	
	f. Persons under the influence of drugs may be high, low or hallucinating.	
	2. **Patient management**	Describe local ordinances.
	a. Evaluate the situation considering causes and possible dangers.	
	b. Display an attitude of sincerity, calmness, confidence and willingness to help.	
	c. Reassure, calm and encourage patient.	
	d. Don't rush; give patient time to quiet down.	
	e. Don't leave the patient alone.	
	f. Don't use force.	
	Note: Alcohol and drugs are discussed below.	
Alcohol (1:05) 0:10	1. **Effects.** Alcohol is a depressant that affects a person's judgment, vision, reaction time and coordination. In very large quantities, it can cause death by paralyzing the respiratory center in the brain.	
	2. **Signs**	
	a. Odor of alcohol on breath	
	b. Swaying/unsteadiness	
	c. Slurred speech	

Time (Elapsed) Actual	Contents	Instructor Notes

d. Nausea/vomiting

e. Flushed face

3. **Caution**

a. These signs can mean illnesses or injuries other than alcohol (e.g., epilepsy, diabetes, head injury).

b. It is therefore especially important that the person with alcohol on his breath (which can smell like the acetone breath of a diabetic) not be immediately dismissed as a drunk.

c. He should be carefully checked for other illnesses/injuries.

4. **Alcohol combines with other depressants.** When alcohol is taken in combination with analgesics, tranquilizers, antihistamines, barbiturates, etc., the depressant effects will be added together and, in some instances, the resultant effect will be greater than the expected combined effects of the two drugs.

5. **Management**

a. The intoxicated patient should be given the same attention given to patients with other illnesses/injuries.

b. The intoxicated patient needs constant watching to be sure that he doesn't aspirate vomitus and that he maintains respirations.

6. **Withdrawal problems**

a. An alcoholic who suddenly stops drinking can suffer from severe withdrawal problems.

b. Sudden withdrawal will often result in DT's (delirium tremens).

c. Signs include:

1) Shaking hands

2) Restlessness

3) Confusion

4) Hallucinations

5) Sometimes maniacal behavior

d. The patient must be protected from hurting himself.

Drugs
(1:15)
0:15

1. **Types**

a. ***Uppers***—stimulants of the central nervous system. They include amphetamines, cocaine, caffeine, anti-asthmatic drugs and vasoconstrictor drugs.

b. ***Downers***—depressants of the central nervous system. They include barbiturates, tranquilizers, marijuana, inhaled solvents and opiates.

c. ***Hallucinogens***—they include LSD, mescaline, psilocybin and peyote. Marijuana also has some hallucinogenic properties.

2. **Amphetamines and cocaine**

a. Amphetamines include Benzedrine and Dexedrine.

Time (Elapsed) Actual	Contents	Instructor Notes

b. Amphetamines and cocaine provide relief from fatigue and a feeling of well-being.

c. Blood pressure, breathing and general body activity are increased.

d. Some users take a "speed run" of repeated high doses. Results are hyperactivity, restlessness and belligerance. Such persons need to be protected from hurting themselves and others. Acute cases need medical attention.

e. At the end of a "speed run," the user is left exhausted and sleeps. On awakening, he is depressed.

f. Respiratory failure can occur with cocaine.

3. **Hallucinogens**

a. These drugs include LSD, mescaline, morning glory seeds, etc.

b. They produce changes in mood and sensory awareness; a person may "hear" colors and "see" sounds.

c. They can cause hallucinations and bizarre behavior that can make the user dangerous to himself and others.

d. Acute cases need medical attention. Patients should be protected from hurting themselves.

4. **Marijuana**

a. Marijuana provides a feeling of relaxation and euphoria.

b. Users report distortions of time and space.

c. In some persons, excessive use can result in a reaction similar to a bad LSD trip.

5. **Barbiturates**

a. Barbiturates include Nembutal, Amobarbital, Seconal and Phenobarbital.

b. These drugs result in relaxation, drowsiness and sleep.

c. Overdoses can produce respiratory depression, coma and death.

d. Withdrawal can cause anxiety, tremors, nausea, fever, delirium, convulsions and ultimate fatality.

6. **Tranquilizers**

a. Tranquilizers include Miltown, Equanil and Valium.

b. They are used to calm anxiety.

c. High doses produce the same effects as barbiturates.

d. Withdrawal can cause the addict problems similar to those occurring from withdrawal from barbiturates.

7. **Inhaled solvents**

a. A person who inhales glue or other solvents (gasoline, lighter fluid, nail polish, etc.) experiences effects similar to those of alcohol.

b. He can die through suffocation.

c. In addition, some inhalants can cause death by changing the rhythm of the heartbeat.

Time (Elapsed) Actual	Contents	Instructor Notes
	8. **Opiates (narcotics)**	
	a. Opiates include opium, morphine, heroin, codeine, paregoric and Demerol.	
	b. They are used medicinally to relieve pain and anxiety.	
	c. Overdoses can result in deep sleep (coma), respiratory depression, and death.	
	d. The pupils of opiate users are described as "pin-point" in size.	
	e. Withdrawal symptoms include, among others, intense agitation, abdominal discomfort, dilated pupils, increased breathing and body temperatures and a strong craving for a "fix."	
	9. **Summary comments regarding care**	Describe local rules pertaining to care of alcohol or drug abuse patients. Describe exceptions to inducing vomiting.
	a. Vomiting should be induced if the overdose was taken in the preceding 30 minutes.	
	b. Hyperactive patients should be protected from hurting themselves and others. They should be reassured and treated calmly.	
	c. Level of consciousness should be maintained.	
	d. Respirations should be carefully monitored since overdoses of depressants can cause respiratory depression and death.	
	e. The EMT should instill confidence. The patient should be assured that he will be alright.	
	f. The EMT should be alert for possible allergic reactions and shock.	
	g. Evidence should be preserved.	
	h. Prompt transportation should be provided.	
Epilepsy (1:30) 0:10	1. **Types**	Identify possible causes.
	a. Grand Mal—major seizure.	
	b. Petit Mal—minor seizure, no unconsciousness.	
	2. **Grand Mal seizure**	
	a. The patient convulses due to a sudden abnormal stimulation of brain cells.	
	b. The convulsions are usually followed by unconsciousness.	
	3. **Emergency care**	
	a. The major requirements of the rescuer is to protect the patient from hurting himself during a seizure.	
	b. The epileptic should not be physically restrained in any way unless he is very wild.	
	c. He should be transported to a medical facility when the seizure is over.	
Problems of Child Patients (1:40) 0:20	1. **General comment.** Techniques of care for children are essentially the same as those for adults with some variations being necessary due to size. For example, the following have already been discussed:	

Time (Elapsed) Actual	Contents	Instructor Notes
	a. Airway obstruction b. Oxygen c. Pulmonary resuscitation d. Cardiopulmonary resuscitation e. Bleeding and shock f. Head, neck and spine injuries g. Chest injuries h. Fractures and soft-tissue injuries i. Abdominal injuries and pain j. Poisonings k. Contagious diseases	Explain that, since they have been covered in this or other course lessons, emergency care procedures will not be repeated here.
	2. Approach a. There are special problems in dealing with children since they are apt to be afraid or unable to communicate, for example: 1) *Fear* a) Of the accident scene—confusion, noise, cries of the injured, view of injured particularly if injured are parents b) Of their own injuries, blood, pain c) Of strangers—therefore, they will fear the emergency medical technician and the care he provides d) Of being confined, as in splints e) Of being trapped, as in vehicles, wells, cave-ins f) Of being separated from parents 2) *Inability to communicate* a) Too young to communicate verbally b) Too frightened to communicate c) Too young to understand what has happened b. The EMT should be reassuring, calm and understanding with child patients. He should: 1) Use simple language and a soft voice 2) Be very gentle in feeling for injuries	
	3. Special problems a. ***Fever.*** A child with an unusually high fever should be cooled before and during transport.	Describe procedures.
	b. ***Convulsions.*** Convulsions are common in young children and frequently associated with fever. The convulsing child needs to be protected from injuring himself.	Explain causes and procedures.
	c. ***Sudden infant death syndrome.*** Death usually occurs during sleep in an apparently healthy baby. The EMT will encounter anguished parents and should endeavor to assist the baby by administering CPR.	Describe typical incident.
	d. ***Child abuse.*** The EMT should be alert to indications of child abuse and report suspicions to medical and other appropriate personnel.	Review indications and local reporting requirements and procedures.
	e. ***Sexual molestation.*** Children of both sexes are subject to sexual molestation. The patient should not be examined unless there is obvious bleeding that requires control. The patient should not wash, urinate or defecate.	Emphasize importance of having a calm professional manner. Review local reporting requirements and procedures.

Time (Elapsed) Actual	Contents	Instructor Notes
Practice	1. Symptom recognition and emergency care for:	Simulate signs and symptoms. Ask student to assess the condition and provide or describe emergency care. The student should demonstrate his approach to the patient and history-taking as appropriate.
(2:00)	a. Diabetic coma	
0:30	b. Insulin shock	
	c. Acute abdomen	
	d. Communicable disease	
	e. Alcohol abuse	
	f. Drug abuse	
	g. Epileptic convulsion	
	h. Problem with child patient	
(2:30)		

Lesson 16

Emergency Childbirth

Objectives

Provide the student with sufficient information for him to:

Describe the meaning and function as appropriate of each of the following terms: fetus, uterus, birth canal, placenta, umbilical cord, amniotic sac, cervix, vagina, perineum, crowning, bloody show, stages of labor, presenting part, abortion, live birth certificate, fetal death certificate.

Identify predelivery emergencies and their care.

Describe how to determine if delivery is imminent.

Describe procedures for assisting the mother in a normal childbirth.

Describe procedures for resuscitating the newborn.

Describe procedures for a breech delivery, prolapsed cord, excessive bleeding, abortion, and multiple birth

Describe typical characteristics and techniques of care for the premature infant, including use of the infant carrier

Provide the student with sufficient practice for him to:

Demonstrate on an obstetrical manikin correct procedures for both normal and abnormal births

Demonstrate on a resuscitation manikin procedures for resuscitating the newborn, including administration of oxygen

Requirements

Equipment/material:

Sterile delivery pack (one for each 6 students)

Obstetrical manikin (one for each 6 students)

Infant resuscitation manikin (one for each 6 students)

Oxygen and delivery system (one for each 6 students)

Premature infant carrier (one for each 6 students)

Illustrations:

Side view of abdominal cavity of non-pregnant female

Side view of abdominal cavity of pregnant female

Crowning vagina

Film: The following (or similar) film showing an actual childbirth is advised.

Emergency Childbirth. Prepared by Department of Transportation. Available from National Audiovisual Center, Washington, D.C. 20409

Instructors:

One for each 6 students during the demonstration/practice period.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.

2. Review references selected for the lesson by the course coordinator.[1]

3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.

4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class. Obtain and preview the film recommended for the lesson. Assure availability of projection equipment.

5. Assure that all equipment and materials required for the lesson are available.

6. Brief all instructor aides regarding their roles and responsibilities during the lesson.

7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.

8. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to the lesson for such a review.

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[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapter 36.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage.** The lesson covers normal and abnormal births and provides for students to practice skills in assisting in deliveries and caring for the mother and the newborn. 2. **Need for lesson.** A childbirth can be an emergency event and knowledge of appropriate procedures will permit better care of both patient and baby. 3. **Lesson objectives** a. Describe the meaning and function as appropriate of each of the following terms: fetus, uterus, birth canal, placenta, umbilical cord, amniotic sac, cervix, vagina, perineum, crowning, bloody show, stages of labor, presenting part, abortion, live birth certificate, fetal death certificate. b. Identify predelivery emergencies and their care. c. Describe how to determine if delivery is imminent. d. Describe procedures for assisting the mother in a normal childbirth. e. Describe procedures for resuscitating the newborn. f. Describe procedures for a breech delivery, prolapsed cord, excessive bleeding, abortion, and multiple birth. g. Describe typical characteristics and techniques of care for the premature infant, including use of the infant carrier. h. Demonstrate on an obstetrical manikin correct procedures for resuscitating the newborn, including administration of oxygen. i. Demonstrate on a resuscitation manikin procedures for resuscitating the newborn, including administration of oxygen.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered. Refer to lesson objectives in the Student Study Guide and review with class.
Relevant Anatomy, Physiology and Terms (0:10) 0:15	1. **Fetus**—developing unborn baby 2. **Uterus**—organ in which the fetus grows 3. **Birth canal**—vagina and lower part of the uterus 4. **Placenta** (afterbirth)—organ through which baby exchanges nourishment and waste products during pregnancy 5. **Umbilical cord**—cord through which infant receives nourishment 6. **Amniotic sac** (bag of waters)—the sac that surrounds the baby inside the uterus	Refer to illustrations of the abdominal cavity of the pregnant and non-pregnant female and define each term.

Time (Elapsed) Actual	Contents	Instructor Notes
	7. **Cervix**—lowest part of the uterus	
	8. **Vagina**—lower part of the birth canal	
	9. **Perineum**—skin area between vagina and anus	
	10. **Crowning**—the bulging-out of the vagina opening as the baby's head presses against it.	Refer to illustration of crowning.
	11. **"Bloody show"**—mucus and blood that come out of the vagina as labor begins	
	12. **Labor**—muscles of uterus open the birth canal and push the baby down through it a. ***First stage***—start of contractions to opening of cervix b. ***Second stage***—opening of cervix to birth of baby c. ***Third stage***—birth of baby to delivery of placenta	
	13. **Presenting part**—the part of the baby that comes out first—usually the head	
	14. **Abortion**—miscarriage	Give local definition.
	15. **Live birth certificate**—a certificate that live birth has occurred	Describe local requirements.
	16. **Fetal death certificate**—a certificate for a stillborn baby	Describe local requirements.
Sterile Delivery Pack (0:25) 0:05	1. Surgical scissors 2. Three hemostats or cord clamps 3. Umbilical tape or sterilized cord 4. Ear syringe, rubber-bulb type 5. Four towels 6. One dozen 4 x 4-inch gauze sponges 7. Three or four pairs of rubber gloves 8. One baby blanket 9. Sanitary napkins 10. Two large plastic bags	Display and describe use of each item in the delivery pack.
Predelivery Emergencies (0:30) 0:05	1. **Convulsions** (from epilepsy or toxemia) a. Place padded tongue depressor or folded towel in mouth. b. Place mother on side. c. Upon regaining consciousness, elevate shoulders and head. d. Give oxygen.	Explain reasons for each action.

Time (Elapsed) Actual	Contents	Instructor Notes
	2. **Heart/lung complications**—give oxygen.	
	3. **Hemorrhage**	
	a. Do **not** examine vaginally.	
	b. Administer oxygen.	
	c. Maintain body temperature.	
	d. Encourage mother to lie on her side.	
	4. **Automobile accidents**—follow general principles of emergency care.	
Initial Considerations (0:35) 0:05	1. It is generally best to transport the mother unless the delivery is expected in a few minutes.	
	2. To determine when delivery is expected, ask:	Give implications of answers to each question.
	a. Has the mother had a baby before?	
	b. Does she feel she has to strain or move her bowels?	
	c. Is the vagina bulging or is baby crowning?	
	3. Precautions:	Explain.
	a. Look, do not touch.	
	b. Do not let mother go to bathroom.	
	c. Do not hold mother's legs together.	
Ten-Minute Break (0:40) 0:10		
Film—Emergency Childbirth (0:50) 0:20	1. The film shows an actual childbirth and means of caring for mother and baby.	Show and critique film.
Demonstration and Practice (1:10) 1:05	1. **Normal delivery**. Procedures are:	Divide class into groups of 6. Using an obstetrical manikin, demonstrate and have class practice each procedure.
	a. Have mother lie with knees drawn up and spread apart. If in automobile, have mother place one foot on the floorboard.	
	b. Place sheet, blanket, or newspaper under buttocks to lift them about 2 inches off the surface.	
	c. Fold sterile towel and place under buttocks.	Give reason.
	d. Place another sterile towel on patient's abdomen and one on surface below opening of vagina.	Give reason.
	e. When the baby's head appears, place the fingers of the gloved hand on its head and exert **very gentle** pressure.	

Time (Elapsed) Actual	Contents	Instructor Notes
	f. If the amniotic sac does not break, use clamp to puncture sac and push sac away from baby's mouth and nose.	
	g. When the head is born, check if umbilical cord is around neck; slip over shoulder or clamp, cut and unwrap.	
	h. Place hand under baby's head for support and suction baby's mouth two or three times and each nostril once.	Remind class that baby is slippery.
	i. As the abdomen and hips are born, place the other hand under those parts—there are now two hands supporting the baby.	
	j. When feet are born, grasp feet.	Demonstrate grasp.
	k. Wipe blood and mucus from mouth and nose with a sterile gauze, suction mouth and nose again.	
	l. Wrap baby in a blanket and place on its side, head slightly lower than trunk.	
	m. Clamp, cut and tie umbilical cord.	
	n. Massage uterus.	
	o. Observe mother for delivery of placenta—few to 30 minutes; if over 20 minutes, transport. If heavy bleeding, transport. Massage uterus, administer oxygen, place sterile pad over vagina.	
	p. When delivered, wrap placenta in towel and put in plastic bag; ½ pint blood normal. Place sterile pad over vaginal opening, lower mother's legs, help her hold them together.	
	q. Record time of delivery and transport mother, baby and placenta to hospital.	
	Note: If baby does not deliver after 20 minutes of contractions every 2 to 3 minutes, transport immediately.	
	2. **Resuscitation of the newborn.** Procedures are:	Demonstrate and have class practice. Describe stillborn and baptismal procedures.
	a. Suction airway as previously described.	
	b. Lay baby on side, head lower than body.	
	c. Snap index finger against bottom of feet; if no response—	
	d. Apply **gentle** mouth-to-mouth/nose resuscitation.	Ask class members to describe procedures.
	e. Continue resuscitation until breathing starts; then oxygen.	
	f. Apply cardiopulmonary resuscitation if no pulse after two minutes.	Ask class members to describe procedures.
	g. Continue cardiopulmonary resuscitation until baby breathes or is pronounced dead by a physician.	
	3. **Breech delivery.** Procedures are:	Demonstrate and have class practice.
	a. Make same preparations as for normal delivery.	
	b. Allow buttocks and trunk to deliver spontaneously.	
	c. Support legs and trunk.	
	d. Allow head to deliver spontaneously.	
	e. If head does not deliver in three minutes, transport immediately. Do not pull baby out.	
	f. After head delivers, continue as in normal birth.	
	g. If only foot or arm protrudes, transport to hospital immediately.	

Time (Elapsed) Actual	Contents	Instructor Notes
	4. **Prolapsed cord.** Procedures are:	
	a. Put mother in shock position—legs elevated, give oxygen, keep mother warm, have her lie on one side.	
	b. Wrap a sterile towel around the visible portion of the cord. Do not replace or put pressure on cord.	
	c. Transport immediately.	
	5. **Excessive bleeding** (more than 5 soaked pads). Procedures are:	
	a. Prevent shock.	
	b. Place sterile sanitary napkin at opening of vagina; save blood-filled pads.	
	c. Do not hold legs together or put hand or anything in vagina.	
	d. Preserve any tissue passed.	
	e. Transport immediately.	Describe symptoms.
	6. **Abortion** (miscarriage). Procedures are:	
	a. Prevent shock.	
	b. Immediately transport.	
	c. Save any passed tissue.	
	7. **Multiple birth**—procedures are the same as for single births.	Describe signs of multiple birth and procedures for delivery.
	8. **Premature infant**	
	a. ***Characteristics***—usually thinner, smaller and redder than a full-term baby with a relatively large head.	
	b. ***Care***	Demonstrate and have class practice.
	1) Keep the baby warm.	
	2) Keep the mouth and throat clear of fluid and mucus.	
	3) Ensure cord does not bleed.	
	4) Administer oxygen.	
	5) Don't infect infant.	
	6) Alert hospital.	
	9. **Premature infant carrier.** Procedures are:	Display and demonstrate use of carrier. Have members of class assist.
	a. Fill hot water bottles, cover and place in carrier.	
	b. Wrap infant in blanket or napkin.	
	c. Make sure carrier is secure in ambulance.	
	Note: The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives.	
Summary and Questions (2:15) 0:15	1. Class questions or comments on the topic of the lesson.	
(2:30)	2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on selected objectives.

Lesson 17

Environmental Emergencies

Objectives

Provide the student with sufficient information for him to;

Describe skin damage and appearance of first-, second- and third-degree heat burns

Use the rule of nines in estimating percentage of body burned

Indicate factors affecting the seriousness of a heat burn

Estimate the seriousness of a heat burn given a description of each factor affecting seriousness

Describe heat burn management procedures

Describe causes, seriousness and management for chemical burns

Describe appearance and management of electrical burns

Describe EMT role in electrically hazardous situations

Identify the ICC symbol for radioactive materials

Describe actions EMT can take to control his exposure to radiation

Describe radiation emergency care procedures for patient and EMT

Describe causes, signs, seriousness and care for patients suffering from heat cramps, heat exhaustion and heat stroke

Identify and describe the five major ways in which the body loses heat

Identify and describe the stages of emergency cooling of the body (hypothermia)

Describe emergency care for a patient suffering from general cooling of the body (hypothermia)

Describe signs, seriousness and emergency care for frostnip, superficial frostbite and deep frostbite

Describe physiological effects of drowning

Describe management for the drowning patient

Describe the problem, signs and care for patients suffering from air embolism and decompression sickness

Requirements

Equipment/materials:

Geiger counter

Illustrations (chart, slide, drawing):

First-, second- and third-degree burns

Rule of nines for adults and infants

ICC identification for radioactive materials

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.

2. Review references selected for the lesson by the course coordinator.[1]

[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 40, 41, 42, 43 and 44.

3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.

4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.

5. Formal evaluation of skills and knowledge will be covered in subsequent lessons.

6. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self.
Introduction (0:05) 0:05	1. **Lesson coverage** a. Heat, chemical, electrical and radiation burns b. Exposure to cold c. Water hazards	Review lesson coverage and objectives. Emphasize importance of knowledge covered.
	2. **Need for lesson.** Proper management of patients suffering from burns, exposure to cold and water hazards can save lives as well as limbs and minimize suffering.	
	3. **Lesson objectives** a. Describe skin damage and appearance of first-, second- and third-degree heat burns. b. Use the rule of nines in estimating percentage of body burned. c. Indicate factors affecting the seriousness of a heat burn. d. Estimate the seriousness of a heat burn given a description of each factor affecting seriousness. e. Describe heat burn management procedures. f. Describe causes, seriousness and management for chemical burns. g. Describe appearance and management of electrical burns. h. Describe EMT role in electrically hazardous situations. i. Identify the ICC symbol for radioactive materials. j. Describe how the EMT can control his radiation exposure. k. Describe radiation emergency care procedures for patient and EMT. l. Describe causes, signs, seriousness and care for patients suffering from heat cramps, heat exhaustion and heat stroke. m. Identify and describe the five major ways in which the body loses heat. n. Identify and describe the stages of emergency cooling of the body. o. Describe emergency care for a patient suffering from general cooling of the body. p. Describe signs, seriousness and emergency care for frostnip, superficial frostbite and deep frostbite. q. Describe physiological effects of drowning. r. Describe management for the drowning patient. s. Describe the problem, signs and care for patients suffering from air embolism and decompression sickness.	Refer to lesson objectives in the Student Study Guide and review with class.

Time (Elapsed) Actual	Contents	Instructor Notes
Burns (0:10) 0:40	1. **Classification.** Burns are classified by degree of damage to the skin.	Refer to illustrations of 1st-, 2nd- and 3rd-degree burns. Ask class members to identify and describe each layer of skin as it is mentioned.
	a. ***First-degree burns.*** In a first-degree burn, only the top layer of the skin is burned and the skin becomes reddened.	
	b. ***Second-degree burns.*** In a second-degree burn there is some damage to the dermis and characteristically the skin blisters.	
	c. ***Third-degree burns.*** In a third-degree burn the entire thickness of the skin is burned down to the subcutaneous fat.	
	1) The skin usually is dry, pale or white but may be brown or even charred.	
	2) There is a loss of sensation in the area due to a destruction of nerve endings.	Briefly describe 4th-, 5th- and 6th-degree burns.
	2. **Rule of nines.** The rule of nines provides a means of estimating the percentage of the body that is burned as follows:	Refer to illustration of rule of nines for adults and infants.

	Adult	Infant
a. Head	9%	18.0%
b. Arms	9% each	9.0% each
c. Torso front	18%	18.0%
d. Torso back	18%	18.0%
e. Genitalia	1%	1.0%
f. Legs	18% each	13.5% each
	100%	100.0%

3. **Criticality.** The degree of seriousness of a burn can be estimated from the following:

a. Degree of the burn

b. Percentage of body burned

c. Location of burn

d. Accompanying complications

e. Age of patient

4. **Critical burns.** The following burns are considered critical:

a. Burns complicated by respiratory tract injuries and other major injuries or fractures.

b. Third-degree burns involving the critical areas of the face, hand and feet.

c. Third-degree burns covering more than 10% of the body surface.

d. Second-degree burns covering more than 30% of the body surface.

5. **Moderate burns**

a. Third-degree burns of 2 to 10% of the body surface excluding face, hands and feet.

b. Second-degree burns of 15 to 30% of the body surface.

c. First-degree burns of 50 to 75% of the body surface.

Time (Elapsed) Actual	Contents	Instructor Notes
	Note: The general condition of the patient must also be considered. For example, a moderate burn in an aged or critically ill person might be serious.	
	6. **Student exercise**	Give the students several examples and have them estimate whether the burns described are critical.
	7. **Management**	
	a. The burned area should be covered with a clean dressing.	
	b. Cold wet applications should be used to relieve the pain.	For 1st- and 2nd-degree burns, immerse the burned part in water for 2 to 5 minutes if possible.
	Note: **Never** use grease (e.g., butter, lard, vaseline) on a burn.	
	8. **Chemical burns.** For chemical burns, the patient needs speedy access to water.	
	a. With the exception of lime (which may be brushed off the skin), chemicals in contact with the skin should be washed off with copious amounts of water as clothing is being removed.	Discuss use of neutralizing agents.
	b. For chemicals in the eye, the rescuer may need to hold the patient's eye open for him and rinsing should continue for up to 20 minutes.	
	9. **Electrical burns**	
	a. Electrical burns can be more serious than they appear since they can penetrate the skin deeply; the burn commonly enters in one place and leaves the body in another so that there are two wounds.	
	b. The major problem with electrical burns is respiratory and cardiac arrest.	
	c. If there are fallen wires or other electrical hazards, the power company or appropriate rescue group should be summoned immediately.	Emphasize role of EMT.
	d. Unless the power company says the power is off, it should be assumed that it is on even though street lights are off.	
	e. Patients should be told to **stay in the vehicle.**	
	f. If there is a fire, they must jump from the vehicle (a child could be thrown from the vehicle). They must not make contact with the vehicle and ground simultaneously.	
Ten-Minute Break (0:50) 0:10		
Burns (continued) (1:00) 0:20	10. **Radiation burns**	
	a. Radiation burns may be nuclear or solar. Since solar burns are basically sunburns, they should be treated as any other first- or second-degree burn. The remainder of the session will therefore be devoted to nuclear burns.	
	b. Radiation is a form of energy transmission.	

Time (Elapsed) Actual	Contents	Instructor Notes
	c. Ionizing radiation (alpha, beta and gamma rays) affects the body cells.	
	1) Alpha and beta particles are dangerous only if swallowed or inhaled—they damage internal organs.	
	2) Gamma rays are very penetrating and dangerous.	
	d. Amount of radiation damage depends on:	List on chalkboard. Display Geiger counter and explain how it is used to measure rate of radiation.
	1) Strength of the source	
	2) Type of radiation delivered	
	3) Duration of exposure	
	4) Area of body affected	
	5) Distance between person and source	
	6) Shielding between person and source	
	e. Regulations of the Interstate Commerce Commission require specific packaging and labeling of radioactive materials.	Refer to illustration of ICC identification for radioactive materials.
	f. ***Emergency care***	
	1) If a hazardous radiation level exists, the patient should be removed from the area as quickly as possible even if some of the rules of initial emergency care are violated.	Emphasize means by which EMT can minimize his exposure.
	2) If there is reason to suspect that there are radioactive materials on the patient's or rescuer's clothes, they should be removed at the edge of the exposed area and disposed of in labeled metal containers with tight lids.	
	3) Both EMT and patient should shower.	
	4) Standard decontamination procedures should be followed for EMT, patient and ambulance. The hospital should be notified.	Identify local regulatory body for radioactive material.
Exposure to Heat (1:20) 0:15	1. **Heat cramps**	
	a. A patient may suffer painful muscle spasms in the extremities after strenuous exercise.	
	b. The cramps will usually be relieved if the patient takes a salt solution.	Explain body water-salt balance.
	2. **Heat exhaustion**	
	a. This is the most common illness caused by heat.	
	b. The patient is usually weak, dizzy or faint, has a headache, no appetite and nausea. Vital signs are usually normal. He may appear gray and skin may be cold and clammy.	
	c. It occurs when patient works hard in a hot environment.	
	d. Muscles and heart need increased blood flow as does the skin.	Ask class member why skin needs increased blood.
	e. The patient should be treated as if he were in shock and should be transported to a medical facility as soon as possible.	
	3. **Heat stroke**	
	a. In a heat stroke, the patient's sweating mechanism has broken down and he is unable to lose body heat through the skin.	Identify typical patient who suffers from heat stroke.

Time (Elapsed) Actual	Contents	Instructor Notes
	b. Important signs are: 1) Very hot, dry skin. 2) Coma or near coma. 3) Very high body temperature. c. This condition is a true emergency. If body temperature rises too high, brain cells can be injured and the patient may die. d. The body should be cooled in any way possible (e.g., cold towels, air from a fan) while the patient is transported to a medical facility where they will likely give the patient an ice-water bath to lower the temperature.	
Exposure to Cold (1:35) 0:15	1. **Heat regulation.** There are five major ways in which the body loses heat: a. Conduction b. Convection c. Evaporation d. Respiration e. Radiation	Give examples of each.
	2. **General cooling of the body (hypothermia)** a. Exposure to cold, snow or ice can result in a general cooling of the body that can go through the following five stages: 1) Shivering—an attempt by the body to generate heat. 2) Apathy. 3) Unconsciousness with a glassy stare, slow pulse and slow respiration rate. 4) Freezing of the extremities. 5) Death. b. **Emergency care.** This is an acute emergency requiring immediate medical attention. Emergency care includes: 1) Keep the patient dry—replace wet clothing. 2) Apply external heat to both sides of the patient using whatever heat sources are available including the body heat of rescuers. 3) If the patient is conscious and in a warm place, give him hot liquids and a warm bath. 4) Monitor respirations and pulse and provide pulmonary and cardiopulmonary resuscitation as required.	Notify hospital in advance.
	3. **Local cooling of the body** a. ***The condition*** 1) When the body is subjected to excessive cold, the water in the cells will freeze; the resulting ice crystals may even destroy the cells. 2) It may be minor (frostnip), superficial, or deep. *Note:* **Never** rub any condition of frostbite; the ice crystals in the tissue can cut and destroy cells. b. ***Frostnip***	

Time (Elapsed) Actual	Contents	Instructor Notes
	1) There is a sudden blanching of the skin—the patient is usually unaware of it. 2) The skin can be warmed by applying firm pressure with a hand (no rubbing) or other warm body part or by blowing hot breath on the spot.	
	c. ***Superficial frostbite*** 1) The skin is white and waxy; it is firm to the touch but the tissue beneath is soft and resilient. 2) Treatment includes providing dry coverage and steady warmth.	
	d. ***Deep frostbite or freezing*** 1) The skin is white and feels hard throughout. 2) This patient needs immediate hospital care. He should be kept warm and resuscitated as necessary.	Describe emergency care procedures. Explain that the limb should not be thawed if the patient must walk on it.
Ten-Minute Break (1:50) 0:10		
Drowning (2:00) 0:05	1. **Condition** a. In most drownings, little water enters the lungs since a laryngeal spasm occurs when foreign material is introduced into the larynx.	
	b. If large amounts of fresh water enter the lungs, the blood cells will be diluted and pulmonary membranes may rupture.	Explain.
	c. If large amounts of salt water enter the lungs, pulmonary edema may result.	Explain.
	2. **Rescue and patient management** a. Direct swimming rescue should be attempted only by personnel trained in lifesaving. Instead, floatable items should be thrown or pushed to the victim.	Give examples.
	b. Immediate resuscitation is necessary—before patient is removed from the water.	
	c. If there is a possibility of a diving accident, the patient should be removed from the water on a backboard.	Explain procedures.
	d. Pulmonary and cardiopulmonary resuscitation should be provided as required.	
Diving Problems (2:05) 0:10	1. In addition to resuscitation problems, two ascent problems require recompression when serious: air embolism and bends (decompression sickness).	
	2. **Air embolism** a. ***Problem.*** Water pressure on the chest is rapidly reduced	

Time (Elapsed) Actual	Contents	Instructor Notes
	and air within the lungs expands. Too rapid expansion ruptures alveoli and damages adjacent blood vessels. A pneumothorax and air embolism can result.	
	b. ***Signs***	
	1) Blotching or itching of skin	
	2) Froth in nose and mouth	
	3) Pain in muscles, joints, tendons, abdomen	
	4) Difficult breathing with chest pain	
	5) Dizziness and vomiting	
	6) Difficulty in seeing properly	
	7) Possible paralysis and coma	
	c. ***Care***	
	1) Provide basic life support and oxygen.	
	2) Place patient on his left side with head and chest lower than feet.	Give reason.
	3) Transport to nearest emergency medical facility.	Give address of nearest recompression chamber.
	3. **Bends**	
	a. ***Problem.*** Nitrogen is carried in the blood as small bubbles and released to tissues slowly. If pressure is released quickly (as in a rapid ascent), bubbles become larger and may obstruct the vessels in which they lie.	
	b. ***Signs.*** Signs range from minor skin rashes and joint pains to serious central nervous system complaints. It is called the bends since patient typically bends over from joint pain.	
	c. ***Care***	
	1) Provide basic life support with oxygen.	
	2) Transport to recompression chamber.	
Summary and Questions (2:15) 0:15 (2:30)	1. Class questions or comments on the topic of the lesson.	
	2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on selected objectives.

Lesson 18

Lifting and Moving Patients

Objectives

Provide the student with sufficient information for him to:

Identify considerations involved in deciding the type of move to be made

Describe emergency moves

Identify principles of lifting and moving that minimize EMT body strain

Describe use and distinguishing features of wheeled stretchers, portable stretchers, stair chairs, long backboards, scoop stretchers

Provide the student with sufficient practice for him to;

Perform a direct two-man lift of a patient from the ground and position him on a stretcher

Perform a two-man extremity lift of a patient from the ground and position him on a stretcher

Immobilize the neck and spine of a patient on a short backboard

Immobilize a patient on a long backboard, move patient and backboard to a stretcher, and position on stretcher

Load stretchers on and unload stretchers from an ambulance

Requirements

Equipment/material:

Ambulance

Blankets (four for each 6 students)

Wheeled stretcher (one for each 6 students)

Portable stretcher (if available)

Stair chair (if available)

Short backboard with straps (one for each 6 students)

Long backboard with straps (one for each 6 students)

Cervical collar (two for each 6 students)

Scoop stretcher (if available)

Sandbags (two for each 6 students)

Illustrations (slide, drawing):

Portable stretcher)

Stair chair) - if actual equipment is unavailable

Scoop stretcher)

Instructors:

One for each 6 students during the practice period.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.

2. Review references selected for the lesson by the course coordinator.[1]

3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.

4. Select or prepare appropriate instructional aids. If instructional aids are not available, be prepared to use chalkboard in class.

5. Assure that all equipment and materials required for the lesson are available.

6. Brief all instructor aides regarding their roles and responsibilities during the lesson.

7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.

8. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to the lesson for such a review.

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[1]The contents of this lesson were based primarily on the following reference:

Patient handling manual. Prepared by Dunlap and Associates, Inc., for the U. S. Department of Transportation (DOT-HS-800-504). Available from U. S. Government Printing Office, Washington, D.C. Chapters 1, 2, 3, 5, 6 and 7.

Selected procedures on use of the short and long backboards were obtained from:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapter 47.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage.** Principles of moving patients; types, uses and distinguishing features of stretchers; practice in lifting and moving patients with and without suspected spine injuries; loading and unloading ambulances. 2. **Need for lesson.** Proper patient handling will minimize injuries and discomfort for both patient and EMT. 3. **Lesson objectives** a. Identify considerations involved in deciding the type of move to be made. b. Describe emergency moves. c. Identify principles of lifting and moving that minimize EMT body strain. d. Describe use and distinguishing features of wheeled stretchers, portable stretchers, stair chairs, long backboards, scoop stretchers. e. Perform a direct two-man lift of a patient from the ground and position him on a stretcher. f. Perform a two-man extremity lift of a patient from the ground and position him on a stretcher. g. Immobilize the neck and spine of a patient on a short backboard. h. Immobilize a patient on a long backboard, move patient and backboard to a stretcher, and position on stretcher. i. Load stretchers on and unload stretchers from an ambulance.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered. Refer to lesson objectives in the Student Study Guide and review with class.
General Considerations (0:10) 0:05	1. In general, a patient should not be moved until he is ready for transportation to a hospital. All necessary emergency care should be provided first. 2. A patient should be moved only if there is an immediate danger to him or others if he is not moved, that is: a. There is a fire or danger of fire. b. Explosives or other hazardous materials are involved. c. It is impossible to protect the accident scene. d. It is impossible to gain access to other victims in a vehicle who need life-saving care. *Note:* A cardiac-arrest patient would typically be moved unless he is on the ground or floor, since cardiopulmonary resuscitation must be performed on a firm surface. 3. If it is necessary to move a patient, the speed with which he is moved will depend on the reason for moving him, for example:	Ask class to identify situations requiring emergency moves.

Time (Elapsed) Actual	Contents	Instructor Notes
	a. ***Emergency move.*** If there is a fire, the patient will be pulled away from the area as quickly as possible.	
	b. ***Non-emergency move.*** If the patient needs to be moved to gain access to others in a vehicle, due consideration will be given to his injuries before and during movement.	
Emergency Moves (0:15) 0:05	1. The major danger in moving a patient quickly is the possibility of spine injury.	
	2. In an emergency, every effort should be made to pull the patient in the direction of the long axis of the body to provide as much protection to the spine as possible.	
	3. It is impossible to remove a patient from a vehicle quickly, and, at the same time, provide protection for his spine.	
	4. If the patient is on the floor or ground, he can be dragged away from the scene by tugging on his clothing in the neck and shoulder area.	Demonstrate on a student.
	5. It may be easier to pull the patient onto a blanket and then drag the blanket away from the scene.	Demonstrate on a student.
	6. Such moves are emergency moves only. They do not really protect the spine from further injury.	
Non-Emergency Moves (0:20) 0:10	1. **General comments**	
	a. All injured parts should be immobilized as much as possible prior to movement.	
	b. All injured parts should be protected as much as possible during movement.	
	2. **EMT protection.** In order to protect himself, the EMT should use the following principles in all non-emergency moves:	
	a. Keep in mind physical capabilities and limitations and do not try to handle too heavy a load. When in doubt, seek help.	
	b. Do not attempt to lower a patient if you feel you could not lift him.	
	c. Keep yourself balanced when carrying out all tasks.	
	d. Maintain a firm footing.	
	e. Maintain a constant and firm grip.	
	f. Lift and lower by bending the legs and not the back—keep the back as straight as possible at all times; bend knees and lift with one foot ahead of the other.	Give reason.
	g. When holding or transporting, keep the back straight and rely on shoulder and leg muscles; tighten muscles of the abdomen and buttocks.	
	h. When performing a task that requires pulling, keep the back straight and pull using the arms and shoulders.	

Time (Elapsed) Actual	Contents	Instructor Notes
	i. Carry out all tasks slowly, smoothly and in unison with your partner.	
	j. Move body gradually; avoid twisting and jerking when conducting the various patient-handling tasks.	
	k. When handling a patient, try to keep the arms as close as possible to the body in order to maintain balance.	
	l. Do not keep muscles contracted for a long period of time.	
	3. **Vehicle moves**	
	a. Lifting a patient from a vehicle will require ingenuity depending on the situation.	
	b. Patients may be completely mobile or partially mobile and thus can assist in the move.	
	c. For completely immobile patients, the rescuer will need to solicit help and move the patient as well as he can under the circumstances.	
	d. The student will have an opportunity to practice moving different types of patients from vehicles in the extrication lesson.	
Stretchers (0:30) 0:20	1. **Types**	Display and describe use and distinguishing features of each type.
	a. ***Wheeled stretcher***—the standard ambulance cot; it is designed to be rolled and is not easily lifted.	
	b. ***Portable stretchers***—easily lifted devices.	
	c. ***Stair chairs***—designed for patient-handling over stairways and through narrow halls and other confined areas.	
	d. ***Backboards***—designed for immobilizing patients with suspected spine injuries; the short board serves as an intermediate device for immobilizing patients who are not in a position that permits direct transfer to the long board, that is, patients seated in cars.	
	e. ***Scoop stretchers***—designed for immobilizing patients with suspected spine injuries; patient must be supine.	
	2. **Positioning**	
	a. Heart attack patients should be semi-reclining.	Ask class to describe positioning of patients with various illnesses/injuries.
	b. Unconscious patients should be on their side with head down.	
	c. Persons with suspected spine injuries should be maintained in position found.	
	d. Legs should be elevated to prevent shock.	
	Etc.	Develop list with class.
Ten-Minute Break (0:50) 0:10		

Time (Elapsed) Actual	Contents	Instructor Notes
Direct, Ground Lift, No Spine Injury, Two or Three Resucers (1:00) 0:10	1. Rescuers line up on one side of the patient. 2. Rescuers drop one knee to the ground (the same knee for each rescuer). 3. The patient's arms are placed on his chest if possible. 4. The head rescuer places one arm under the patient's neck and shoulder and cradles the patient's head. 5. The head rescuer places his other arm under the patient's lower back. 6. A second rescuer places one arm under the patient's knees and one arm above the buttocks. *Note:* If there is a third rescuer, he places both arms in the waist area and the other two rescuers slide their arms up to the mid-back or down to the buttocks as appropriate. 7. On signal, rescuers lift the patient to their knees and roll him in toward their chests (the rescuers' backs are now straight and they are supporting the patient by their arms and chests). 8. On signal, the rescuers stand, move the patient to a stretcher. 9. To replace the patient on the ground or on a low cot, the procedure would be reversed.	Select two students to demonstrate technique on fellow student.
Extremity Lift, No Fractures (or All Fractures Splinted), Two Rescuers (1:10) 0:10	1. One rescuer kneels at the head of the patient and one at the side by the patient's knees. 2. The head rescuer places one hand under each of the patient's shoulders while the foot rescuer grasps the patient's wrists. 3. The foot rescuer pulls the patient to a sitting position; the head rescuer assists by pushing the patient's shoulders up and supporting his back and head with his body. 4. The head rescuer slips his hands under the patient's arms and grasps the patient's wrists. 5. The foot rescuer slips his hands under the patient's knees. 6. Both rescuers crouch on both feet. 7. They stand simultaneously and move with the patient to a stretcher.	Select two students to demonstrate technique on fellow student.
Immobilization on Short and Long Backboards (1:20) 0:05	1. Support patient's head. 2. Immobilize neck with collar/blanket/sandbags. 3. Position board behind patient (shortboard),	**Briefly** review procedures since they were previously practiced in Lesson 10.

Time (Elapsed) Actual	Contents	Instructor Notes
	or Shove board beneath patient (long board). 4. Pad board as appropriate and secure straps. 5. Assure that patient is secure.	
Practice (1:25) 1:35	1. Working in groups of three, four, or five as appropriate, students should practice: a. Lifting a patient from the floor and positioning him on a stretcher using: 1) The direct ground lift 2) The extremity lift *Note:* It is suggested that the instructor describe the nature of each patient's illness/injury/conscious state so that he may be positioned appropriately on the stretcher. b. Immobilizing a patient with a suspected spine injury on a short backboard. c. Immobilizing a patient with a suspected spine injury on a long backboard, lifting him from the floor and positioning patient and backboard on a stretcher.	Divide class into groups of 6. Monitor and critique each student. Permit students to practice until they can perform without error. Make sure patient and board are secured on stretcher.
(3:00)	2. During the practice period, each group of students should practice loading and unloading stretchers from an ambulance. *Note:* The instructor should use the practice period not only for perfection of skills but also for emphasis of all lessson coverage required for students to achieve the lesson objectives.	Advise students of appropriate clothing to wear for next lesson (extrication).

Lesson 19

Extrication from Automobiles

Objectives

Provide the student with sufficient information for him to:

Describe the role of the EMT in extrication

Describe techniques that the EMT can use to gain access to or disentangle patients from vehicles

Provide the student with sufficient practice for him to package patients with **both** spine **and** other injuries in a vehicle and remove them from the vehicle

Requirements

Equipment/material:

Vehicle, preferably wreck (one for each 6 students)

Long backboard with straps (two for each 6 students)

Sling (one for each 6 students)

Short backboard with straps (one for each 6 students)

Cervical collar (one for each 6 students)

Triangular bandage (one for each student)

Roller-type bandage (one for each student)

Universal dressing/gauze pad (one for each student)

Paper cup/cone or eye shield (one for each 6 students)

Upper extremity splints (one set for each 3 students)

Lower extremity splints (one set for each 3 students)

Blanket (one for each 3 students)

Adhesive tape (one for each 6 students)

Facility:

The lesson can be conducted outdoors in a parking lot or field or, if desired, indoors in some appropriate facility such as a garage or armory.

Instructors:

One for each 6 students.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for practice.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture.
4. Check with your local rescue crew to ensure that procedures for gaining access to patients and disentangling patients are appropriate for your area.
5. Assure that all equipment and materials required for the lesson are available. Assure that the facility is appropriate for the lesson.
6. Brief all instructor aides regarding their roles and responsibilities during the lesson.

7. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluation of both skills and knowledge will be accomplished in subsequent lessons.

8. In conjunction with the course coordinator, provide a carefully prepared and hazard-free environment.

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[1]The contents of the lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapter 47.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage.** The lesson provides basic hints on gaining access to and disentangling patients from vehicles. The major emphasis of the lesson is practice in packaging patients with suspected spine **and** other injuries and removing them from vehicles. 2. **Need for lesson.** The EMT may be the first at the accident scene and should know simple procedures for gaining access to and disentangling patients. Proper patient packaging and removal will minimize danger of further injury or aggravation of existing injuries. 3. **Lesson objectives** a. Describe the role of the EMT in extrication. b. Describe techniques that the EMT can use to gain access to or disentangle patients from vehicles. c. Package patients with **both** spine **and** other injuries in a vehicle and remove them from the vehicle.	Advise students that this lesson provides only a brief exposure to extrication. A complete course is available from the Department of Transportation. Review lesson coverage and objectives. Emphasize criticality of skills and knowledge covered.
Basic Considerations (0:10) 0:05	1. **Role of the EMT** a. His responsibility is to administer necessary care to the patient before extrication and to assure that the patient is removed from the vehicle in such a way as to minimize further injury. b. If rescue crews are **not** present, he should be prepared to use prying and cutting tools to gain access to the patient and disentangle the vehicle from the patient. c. If rescue crews are present, he should cooperate with their activities but should not allow their activities to endanger the patient. d. If rescue crews are present, the EMT should attend to the needs of the patient while rescue activities proceed if possible. 2. **Basic principles of emergency care** a. Patient care precedes extrication unless delayed movement would endanger the life of the patient or rescuer. Patient care should include: 1) Attention to life-threatening emergencies 2) Immobilization of fractures b. Cervical and thoracic fractures should be suspected in unconscious patients. c. All patients should be packaged and moved carefully to minimize danger of further injury or aggravation of existing injuries. 3. **Stages of extrication**	Divide class into groups of 6. Ask class to suggest other patient care that could be provided. Describe each stage.

Time (Elapsed) Actual	Contents	Instructor Notes
	a. Gaining access to patients b. Attending to life-threatening emergencies c. Disentanglement d. Preparation for removal (patient packaging) e. Removal	
Access and Disentanglement	1. **Closed upright vehicle** a. ***Opening doors.*** Access to the patient may be made by simply opening one of the car doors. b. ***Windows.*** If the doors are jammed or inaccessible, the best means of gaining access may be through one of the windows. 1) Rear windows will typically shatter when struck in lower corners. 2) Front and rear windows of older cars may be removed by removing the molding from around the glass with a screwdriver. c. ***Prying doors*** 1) In model cars prior to about 1967, a jammed door may be forced open with a jackhandle. 2) In 1967 (approximately) and newer cars, the door cannot be pried open; it must be cut. d. ***Cutting*** 1) Any sharp tool and a hammer can be used to cut car metal. 2) In 1967 and newer model cars, a cut may be made around the lock to open a jammed door. 3) The roof of a car is probably the easiest place to cut. Roll bars in a roof may hamper access. 4) Cutting metal is time-consuming with simple tools. The EMT should summon a rescue crew. 2. **Overturned closed vehicle** a. ***General rule.*** The vehicle should be left in the position in which it is found, that is, upside down or on its side. Righting the vehicle could cause additional injuries to the patient. b. ***Stability.*** No attempt should be made to enter the vehicle until its stability is assured. 1) It should be shored up if necessary with any available appropriate materials, that is, a spare tire, wheel chocks from trucks, timber, rocks, etc. c. ***Opening doors.*** If a door is open, it should be tied open. A prop could be knocked out and a slamming door could cause additional injuries. d. ***Windows.*** If the doors do not open, breaking the rear window is probably the fastest means of gaining access. 2) A vehicle in a precarious position on a cliff or hillside 3. **Pinned patients** a. The appropriate rescue service should be summoned when patients are pinned beneath vehicles.	Briefly review procedures. Demonstrate procedures where possible or appropriate. Emphasize that first step is to survey the scene for hazards, e.g., electrical hazards.

Time (Elapsed) Actual	Contents	Instructor Notes
	b. The following simple procedures may be used: 1) A jack may be used to raise the vehicle. 2) Blocks and a pry bar can be used. 3) Many hands (bystanders) can assist in moving a vehicle. *Note:* It is especially important that the vehicle be shored up as it is moved to make sure it does not fall back down on the patient, rescuers or bystanders. *Note:* A jack cannot be used with a completely overturned vehicle. c. Patients whose heads, arms or other body parts have been thrown through the windshield or other car window need special attention as follows: 1) The extruded part should be padded as well as possible with bandaging materials. 2) A knife or pliers can be used to break or fold away the glass so that the patient part can be freed. *Note:* The rescuer should wear work gloves. 4. **Patients jammed inside vehicles** a. Power tools may be necessary to free patients who are jammed inside wrecked vehicles. However, certain simple procedures should not be forgotten. b. If a foot is caught and is uninjured, it may be possible to free it by removing the shoe. c. The front seat may be moved to give additional working space. d. The back seat might be lifted out completely. e. A knife could be used to cut seat belts. If victims are dangling upside down in seat belts, they must be supported as the belt is being cut.	
Packaging and Removal—Demonstration and Practice (0:30) 2:30	*Note 1:* Included here are procedures for extricating patients from inside and underneath an upright vehicle. If it is possible for the instructor to obtain additional vehicles and if additional time is available, it would be advisable to include extrication of patients from a vehicle on its side and on its top. Ideally, wrecked automobiles should be used for this session to attain realism. *Note 2:* In addition to simulated spine injuries, patients for this practice session should have other simulated injuries. Students will thus have an opportunity to practice in a field setting skills learned in this lesson as well as certain skills learned in previous lessons. Suggested patient situations to the various working groups are: The patient has a closed fracture of the right femur. The patient has a fractured right knee and multiple lacerations of the scalp. The scalp is bleeding profusely. The patient is draped over the steering wheel. Blood is oozing from his neck. The patient has an open fracture of the right humerus and a closed fracture of the right ulna. He is losing blood rapidly.	Provide two 10-minute breaks during the practice period. It is suggested that victims act out their roles. Student EMT's will be expected to assess the patient's condition and provide appropriate emergency care. Students may need to improvise in the vehicle, e.g., immobilizing a fractured femur. Students should act professionally, e.g., explaining to conscious victims what they are doing, reassuring them, etc.

Time (Elapsed) Actual	Contents	Instructor Notes
	The patient has an avulsed left eye and a depressed fracture in the front part of the skull.	
	The patient has two broken ankles.	
	The patient has a dislocated hip.	
	The patient has a flail chest.	Demonstrate and have class practice.
	The patient has a severe gash extending from his left eye to his left ear, and a deep 7-inch gash in his upper left arm. Blood is spurting from the arm.	
	The patient is breathing with great difficulty. A sucking sound is heard each time he breathes.	
	1. **Removing an unconscious patient from the front seat.** Procedures are:	
	a. Support patient's head.	
	b. Apply cervical collar.	
	c. Slide short backboard behind patient—pad backboard as appropriate.	
	d. Attach straps to patient's forehead, chin and thighs.	
	e. Rotate patient's torso and legs.	
	f. Slide patient onto long backboard—pad board as appropriate.	
	g. Loosen thigh straps of short board and strap patient securely on long board.	
	2. **Removing an unconscious patient from the floor between the front seat and firewall.** Procedures are:	
	a. Support head.	
	b. Apply cervical collar.	
	c. Slide rope sling across patient's chest and under arms—pad as appropriate; tighten ring slide or buckle.	
	d. Slide patient out of vehicle onto long backboard—pad board as appropriate.	
	e. Strap patient securely to long board.	
	3. **Removing an unconscious patient from the floor of the back seat.** Procedures are:	
	a. Support head.	
	b. Apply cervical collar.	
	c. Slide short backboard behind patient—pad board as appropriate.	
	d. Attach straps to patient's forehead, chin and thighs.	
	e. Lift patient onto front seat—lift the patient, **not** the board.	
	f. Rotate patient's torso and legs.	
	g. Slide patient onto long backboard—pad board as appropriate.	
	h. Loosen thigh straps of short board and strap patient securely to long board.	
	4. **Removing an unconscious patient from beneath an upright car.** Procedures are:	

Time (Elapsed) Actual	Contents	Instructor Notes
	a. Support head. b. Apply cervical collar. c. Slide rope sling across patient's chest and under arms—pad as appropriate; tighten rope sling or buckle. d. Slide patient from beneath vehicle onto long backboard—pad as appropriate. e. Strap patient securely to long board. *Note:* The instructor should use the practice period not only for perfection of skills but also for emphasis of all lesson coverage required for students to achieve the lesson objectives. *Note:* Students should be reminded that the next lesson is a practice, test and evaluation lesson.	
(3:00)		

Lesson 20

Practice, Test and Evaluation— Medical Emergencies, Emergency Childbirth, Environmental Emergencies, Lifting and Moving

Objectives

Administer a written test to evaluate student attainment of the knowledge objectives specified for Lessons 14 through 19.

Permit the student to practice skills taught in Lessons 14 through 19.

Evaluate student attainment of the skill objectives specified for Lessons 14 through 19.

Requirements

Equipment/material:

Written test covering topic area (one for each student)

Checklist (one for each student for each skill included in the evaluation session)

Sterile delivery pack (one for each 6 students)

Obstetrical manikin (one for each 6 students)

Blankets (four for each 6 students)

Cervical collar (two for each 6 students)

Short backboard with straps (one for each 6 students)

Long backboard with straps (one for each 6 students)

Instructors:

One for each 6 students during the evaluation session.

Note: It is recommended that this lesson include three or four additional instructor aides to serve as patients during the evaluation of the skilll of patient assessment. Each patient should simulate a different problem.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for this lesson.

Instructor Tasks

1. **Evaluation of knowledge objectives**

It is assumed that instructors for individual lessons will assist the course coordinator in developing written test items for the lessons they teach. It will be the responsibility of the course coordinator to assemble a balanced test that is directed toward assessing whether or not the knowledge objectives of Lessons 14 through 19 have been achieved.

The instructor for the first part of this lesson serves largely as a monitor of the test itself. He should assure that he has sufficient copies of the test for each student and should review all procedures for completing the test so that he can explain these procedures correctly to the students.

2. **Evaluation of skill objectives.**

In order to assure that all students are evaluated in the same manner, the instructor should have a checklist on which he can check off the principal features of the skill to be evaluated. This checklist essentially comprises the student's evaluation sheet. It is assumed that the checklist will be prepared by the instructor and course coordinator. To aid in designing checklists, the lesson plan identifies certain features of each skill. These may be refined into a list of steps. The resultant steps may not be all of equal weight in skill evaluation. The primary purpose of the checklist is to aid instructors in **standardizing** their evalua-

tions of student performance. All instructors must be briefed on checklist use.

Detailed procedures are not specified for the lesson since they will vary depending on the number of students in the class, the number of instructors and the amount of material available. It is suggested that the instructors divide among themselves the skills to be evaluated. In effect, the lead instructor should set up test stations. He should also assure that all materials required for the lesson are available.

All instructors should be thoroughly briefed on their responsibilities. Needless to say, each instructor should review the lesson plans and references so that they are thoroughly knowledgeable about their contents.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	
Evaluation of Knowledge Objectives (0:05) 0:30	1. Student completion of written test designed to evaluate attainment of the knowledge objectives specified for Lessons 14 through 19.	Distribute test. Explain procedures for taking test. Collect completed papers.
Ten-Minute Break (0:35) 0:10		
Practice and Evaluation of Skill Objectives (0:45) 2:15	1. **Practice.** Working in groups of two or three as appropriate, each student should be permitted to practice each skill until he feels prepared to be evaluated on that skill.	Explain procedures to be followed in the practice and evaluation session.
	2. **Evaluation.** The instructor should use a checklist to evaluate student proficiency in performing the following skills:	
	a. ***Normal emergency childbirth.*** Working with an obstetrical manikin, the student should demonstrate proficiency in assisting in a normal childbirth. Performance should include:	Maneuver infant manikin.
	1) Donning sterile gloves 2) Placing blanket under buttocks to raise buttocks 2 inches 3) Placing sterile towels under buttocks and below opening of vagina 4) Placing fingers of gloved hand on baby's head and exerting gentle pressure 5) Placing hand under baby's head for support and suctioning baby's mouth two or three times and nostrils once 6) Placing the other hand under the lower back and hips as these are born 7) Grasping feet 8) Wiping blood and mucus from mouth and nose with sterile gauze; suctioning mouth and nose again 9) Clamping, cutting and tying umbilical cord 10) Wrapping baby in a blanket and placing it on its side, head slightly lower than trunk	
	b. ***Breech delivery.*** Working with an obstetrical manikin, the student should demonstrate proficiency in assisting in a breech delivery. Performance should include:	Maneuver infant manikin.
	1) Donning sterile gloves 2) Placing blanket under buttocks to raise buttocks 2 inches	

Time (Elapsed) Actual	Contents	Instructor Notes

3) Placing sterile towels under buttocks and below opening of vagina

4) Allowing buttocks and trunk of baby to deliver spontaneously; supporting legs and trunk

5) Allowing head to deliver spontaneously

6) Wiping blood and mucus from mouth and nose with sterile gauze; suctioning mouth and nose

c. ***Two-man direct ground lift.*** Working in pairs on an instructor or another student, each student should demonstrate proficiency in a two-man direct ground lift. Performance should include:

1) Lining up on one side of patient (both EMT's)

2) Dropping same knee to the ground (both EMT's)

3) Placing patient's arms across chest (head EMT)

4) Cradling patient's head by placing one arm under the patient's neck and shoulder (head EMT)

5) Placing one arm under the patient's knees and one arm above the buttocks (foot EMT)

6) On signal, lifting the patient to their knees and rolling him in toward their chests (both EMT's)

7) On signal, standing with the patient (both EMT's)

d. ***Two-man extremity ground lift.*** Working in pairs on an instructor or another student, each student should demonstrate proficiency in a two-man extremity lift. Performance should include:

1) Kneeling at the head of the patient and placing one hand under each shoulder (head EMT)

2) Kneeling by the patient's knees and grasping the patient's wrists (foot EMT)

3) Pulling the patient to a sitting position (foot EMT) while pushing the patient's shoulders up and supporting his back and head with his body (head EMT)

4) Slipping his hands under the patient's arms and grasping the patient's wrists (head EMT)

5) Slipping his hands under the patient's knees (foot EMT)

6) Crouching on both feet (both EMT's)

7) Standing simultaneously (both EMT's)

e. ***Immobilization—long backboard.*** Working in pairs on an instructor or another student, each student should demonstrate proficiency in immobilizing a patient with a suspected spine injury on a backboard. Performance should include:

1) Supporting the patient's head (head EMT)

2) Applying cervical collar (second EMT)

3) Straddling patient and lifting shoulders slightly (second EMT)

4) Shoving board beneath patient and patient onto board

5) Padding board as appropriate

6) Securing straps

7) Lifting patient and board

f. ***Immobilization—short backboard.*** Working in pairs on an instructor or another student, each student should demonstrate proficiency in immobilizing the head and

Time (Elapsed) Actual	Contents	Instructor Notes
	spine of a patient on a short backboard. Performance should include: 1) Supporting the patient's head (head EMT) 2) Applying cervical collar (second EMT) 3) Placing board behind patient (second EMT) 4) Padding board as appropriate 5) Securing straps	
	g. ***Patient assessment.*** Working alone on a simulated patient, each student should assess the patient's condition and describe (or perform as appropriate) proper emergency care. Performance should include: 1) Establishing and maintaining rapport with conscious patient 2) Checking the patient's signs and symptoms and taking patient's history (from patient and/or witnesses) 3) Identifying probable patient problems and performing or describing appropriate actions.	Rotate students through the victims' stations so that each student assesses each victim.
(3:00)		

Lesson 21

Operations—Driving and Maintaining an Emergency Vehicle, Records and Reports, Communications, and Procedures at Emergency Departments

Objectives

Review student performance during the previous practice test and evaluation session.

Provide the student with sufficient information for him to:

Describe laws relating to operation of an emergency vehicle

Identify factors contributing to safe driving

Describe typical causes of unsafe speed and accidents

Identify vehicle systems and equipment requiring daily inspection and those requiring inspection after each run

Identify reasons that records are maintained and typical information recorded by EMT's in the area

Describe uses of communication systems and typical systems and procedures used in the area

Describe typical EMT responsibilities and procedures at emergency departments in the area

Requirements

Material/equipment:

Typical records and reports completed by EMT's or maintained by ambulance services in the area (one for each student)

Portable radio

Instructors:

The instructor for the review portion of this lesson should be an individual knowledgeable about the previous practice, test and evaluation session.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lecture. Much of this lesson depends on a knowledge of local procedures, equipment and systems and will need to be developed locally. The instructor should check with ambulance services, other emergency services and emergency departments to assure that the information he provides will be up to date.
4. Formal evaluation of knowledges will be accomplished in subsequent lessons.

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[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Chapters 48, 49 and 50.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	*Note:* The review part of the lesson should be conducted by an individual knowledgeable about the previous practice, test and evaluation session. Distribute student tests. Review test pointing out correct answers and discussing common errors. Review overall performance and discuss types of errors made by class members. Review lesson coverage and objectives.
Review of Previous Lesson (0:05) 0:20	1. Written test—correct answers and common errors made in the written test administered in the previous lesson. 2. Practical examination—overall class performance and common errors made in the demonstration of skills in the previous lesson.	
Introduction (0:25) 0:05	1. **Lesson coverage.** Review of previous lesson, laws regulating operation of emergency vehicles, factors contributing to safe driving, maintaining a safe and ready vehicle, EMT records and reports, communication systems, procedures at emergency departments.	
	2. **Need for lesson.** The lesson has been included to provide the student with some knowledge of and familiarity with the operational aspects of the EMT's job in the area in which he will be working.	Point out that equipment, systems and procedures will vary locally.
	3. **Objectives** a. Review student performance during the previous practice, test and evaluation session. b. Describe laws relating to operation of an emergency vehicle. c. Identify factors contributing to safe driving. d. Describe typical causes of unsafe speeds and accidents. e. Identify vehicle systems and equipment requiring daily inspection and those requiring inspection after each run. f. Identify reasons that records are maintained and typical information recorded by EMT's in the area. g. Describe uses of communication systems and typical systems and procedures used in the area. h. Describe typical EMT responsibilities and procedures at emergency departments in the area.	Refer to lesson objectives in Student Study Guide and review with students.
Driving an Emergency Vehicle (0:30) 0:30	1. **Laws, regulations, ordinances.** Review of laws, regulations or ordinances in the area relative to the operation of an emergency vehicle, including as appropriate: a. Vehicle parking or standing regulations. b. Procedures at red lights, stop signs and other intersections. c. Regulations regarding speed limits. d. Exemptions from following direction-of-movement regulations or specified turns. e. Standard emergency or disaster routes.	Point out commonly accepted procedures in other communities where these are divergent from local procedures.

Time (Elapsed) Actual	Contents	Instructor Notes
	f. Use of audible signals, e.g., sirens.	
	g. Use of visual signals, e.g., lights.	
	2. **Factors that might make an EMT use inappropriate driving speeds**	Discuss each factor.
	a. ***Lack of expertise in the dispatcher.*** He should be an experienced EMT capable of judging the urgency of an emergency case.	
	b. ***Inadequate equipment in the ambulance.*** If the EMT cannot stabilize the patient with available equipment, the patient will need speedy transport.	
	c. ***Inadequate training of the EMT.*** If the EMT does not have proper training to stabilize the patient, he must transport the patient rapidly.	
	d. ***Inadequate driving ability.*** The EMT needs training in the driving of his emergency vehicle.	
	3. **Factors contributing to safe driving.** The driver:	Discuss effect of each factor.
	a. Is alert to changing weather and driving conditions.	
	b. Follows specified routes for routine runs but has alternate routes for contingencies.	
	c. Uses extreme left-hand lane on multilane highway.	
	d. Drives defensively.	
	e. Uses care in exercising the right-of-way privilege.	
	f. Exercises care in use of siren.	
	g. Maintains safe following distances.	
	h. Requests other emergency assistance (e.g., police) as needed.	
	4. **Intersection accidents.** These are the most common and include:	Emphasize that emergency vehicles must always pause at intersections to assure safety before proceeding.
	a. Motorist arrives at intersection as light changes so he doesn't stop.	
	b. One emergency vehicle follows another too closely and waiting motorist is not expecting it.	
	c. Vision is obstructed by vehicles and a pedestrian may be struck.	
	5. **Student exercise**—illnesses/injuries representing true emergencies. Examples include:	Ask class to give examples of true emergencies in which speed might be justified. Discuss and list on chalkboard. Emphasize that, if the problem is controllable, there is no need for speed.
	a. Severe chest injuries, e.g., crushed chest	
	b. Severe poisons	
	c. Severe uncontrollable bleeding	
	d. Prolapsed cord in childbirth, breech birth when head fails to deliver, birth where only foot or hand delivers	
	e. Severe anaphylactic reactions	
	f. Severe shock	
	g. Heat stroke	

Time (Elapsed) Actual	Contents	Instructor Notes
Ten-Minute Break (1:00) 0:10		
Maintaining a Safe and Ready Vehicle (1:10) 0:15	1. **General considerations.** The vehicle requires routine maintenance, daily inspection, and inspections after each run.	Ask class for suggestions. List on chalkboard.
	2. **Daily inspections.** Inspection should include:	
	a. Inspection of vehicle systems	
	1) Fuel	
	2) Oil	
	3) Fluid circulation system	
	4) Battery	
	5) Brakes	
	6) Tires	
	7) Wheels	
	8) Headlights	
	9) Stoplights	
	10) Turn signals	
	11) Emergency lights	
	12) Wipers	
	13) Horn	
	14) Siren	
	15) Windows	
	16) Door closing and latching devices	
	17) Communication equipment	
	18) Power systems	
	19) Air-conditioning, heating and ventilating systems	
	b. Inspection and inventory of emergency care equipment and supplies	Emphasize importance of having full complement of all equipment and supplies and of having a standard stowage place in the vehicle for each item.
	c. Cleanliness of exterior and interior of vehicle	
	3. **Inspections after each run**	
	a. There should be a sufficient supply of fuel depending on expected duration of runs.	
	b. There should be a full supply of emergency care equipment and supplies.	
	c. The interior of the vehicle and equipment and supplies should be cleaned or decontaminated as necessary.	
Records and Reports (1:25) 0:25	1. **General consideration**	
	a. Information must be obtained and records maintained to:	
	1) Provide for continuity of care	
	2) Furnish source of information for evaluating quality of care	
	3) Provide data for analysis of causes, types and degree of illness and injury requiring emergency care	

Time (Elapsed) Actual	Contents	Instructor Notes
	4) Furnish legal evidence 5) Provide administrative records b. Although records are important, they never take precedence over emergency care.	
	2. **Record forms.** Record forms vary but certain information is typically obtained, for example: a. Patient's name, age, sex, address b. Type of injury or nature of illness c. Cause of accident if known, e.g.: 1) Vehicle accident—single or multiple 2) Animal bite—type of animal 3) Violent case, e.g., suicide, homicide, rape 4) Radiation, chemical or gas hazard 5) Fire 6) Explosion d. Location of patient when first seen—be specific especially if vehicular accident on highway or violent case e. Rescue measures preceding emergency care f. Care given at site or during transport g. Vital signs and changes in vital signs during transport h. Hospital to which patient was taken i. Disposition of patient's valuables j. Signature of patient or relatives if patient care is refused k. Procedures followed and disposition of patient in the event of death l. Dying statements m. Circumstances involved in homicide, suicide, rape n. Statements made by patient or others that might serve as legal testimony o. Administrative information, e.g.: 1) Date of call 2) Time of call 3) Name and telephone number of caller 4) Time of dispatch 5) Time of arrival at scene 6) Time of leaving scene 7) Time of arrival at emergency room 8) Time of leaving emergency room 9) Time of return to base 10) Patient's insurance identification 11) Name of dispatcher 12) Names of EMT's responding to the call 13) Type of run to scene—emergency/routine 14) Type of run to hospital—emergency/routine	Distribute and review local record forms, typical information obtained and need for the information. Distribute typical dispatch form and review with students.
	3. EMT's should save suicide notes and safeguard homicide weapons for the proper authorities when they are not present at the scene of the emergency.	

Time (Elapsed) Actual	Contents	Instructor Notes
	4. All information obtained should be considered confidential and should be released only to the proper authorities.	
Ten-Minute Break (1:50) 0:10		
Communications (2:00) 0:30	1. **Importance and uses** a. Detection and reporting of accidents b. Assignment of calls to specific purveyors c. Maintaining contact between the vehicle, dispatcher and hospital. d. Alerting of other emergency resources e. Relating information on patient's condition and obtaining information on care of patient f. Distributing patients among hospitals g. Alerting hospital emergency departments of type of patient being brought in	
	2. **Typical communications.** Review of typical communications equipment available and procedures used in the area. *Note:* Communications systems may vary among communities and students will need to learn specific procedures followed in the area in which they provide services.	Describe how each of the steps in 1, above, is handled. Review FCC regulations. Display portable radio and demonstrate local communication procedures.
Procedures at Emergency Departments (2:30) 0:15	1. Typical responsibilities and procedures at hospitals in the area, including as appropriate: a. Advance notification of arrival b. Identification of high priority patients c. Compliance with hospital regulations d. Rendering of reports as required e. Retrieval of equipment and supplies f. Rendering assistance as needed and prompt departure Etc.	Review typical procedures used in the area.
Summary and Questions (2:45) 0:15	1. Class questions or comments on the topic of the lesson. 2. Demonstration by selected class members of achievement of lesson objectives.	Question class members on selected objectives.
(3:00)		

Lesson 22

Responding to an Ambulance Call: A Review of Factors Affecting Ambulance Run Efficiency and Patient Assessment

Objectives

Provide the student with an opportunity to apply selected knowledge learned in the course by:

Identifying information that can aid the EMT in planning an emergency ambulance run

Defining and describing the implications of variations in each vital sign

Describing patients suffering from various illnesses/injuries

Performing patient examinations

Provide the student with sufficient information for him to:

Identify patients who would be considered of highest, second highest and lowest priority for triage purposes

Identify EMT responsibilities at the scene, enroute to the hospital and at the hospital

Requirements

Instructors:

It is recommended that 3 or 4 instructor aides be available to serve as victims during the practice period. There should be an additional instructor for each instructor aide.

Instructor Tasks

1. Review the lesson outline to assure understanding of contents and procedures.
2. Review references selected for the lesson by the course coordinator.[1]
3. Use the references and your own knowledge and experience to enrich the lesson outlines as appropriate when you deliver your lectures.
4. Brief all instructor aides regarding their roles and responsibilities during the lesson.
5. Before completing the lesson, make sure that all students can perform the skills as specified—formal evaluaton of skills and knowledge will be accomplished in subsequent lessons.
6. If the course coordinator determines that a review of the previous lesson is required, additional time will need to be added to this lesson for such a review.

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[1]The contents of this lesson were based on the following reference:

American Academy of Orthopaedic Surgeons. **Emergency care and transportation of the sick and injured.** (Second Edition) Chicago, Illinois, 1977. Entire text, especially Chapter 4.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	If new instructor, introduce self and instructor aides.
Introduction (0:05) 0:05	1. **Lesson coverage.** This lesson provides an overview of factors to consider in planning an ambulance run, examining and performing triage at the emergency scene, and delivery of the patient to the emergency medical facility. It also includes a review of the vital signs and provides additional practice in patient examination and assessment. 2. **Need for lesson** a. It is very important that the EMT plan his emergency run in an efficient manner in order to bring expert emergency care quickly to the patient. b. It is critically important that the rescuer know how to check all vital signs and the implications of variations in signs in patient diagnosis and care. c. Performance of a thorough patient examination can reveal injuries that require care before the patient is moved. Providing the care can minimize damage to the patient and shorten recovery time. d. A knowledge of high priority patients and triage procedures will enable patients most in need to be transported most expeditiously to the emergency medical facility. 3. **Lesson objectives** a. Identify information that can aid the EMT in planning an emergency ambulance run. b. Define and describe the implications of variations in each vital sign. c. Describe patients suffering from various illnesses/injuries. d. Perform patient examinations. e. Identify patients who would be considered of highest, second highest and lowest priority for triage purposes. f. Identify EMT responsibilities at the scene, enroute to the hospital and at the hospital.	Review lesson coverage and objectives. Emphasize importance of skills and knowledge covered. Explain that the lesson primarily represents a review and integration of selected course knowledge and skills. Refer to lesson objectives in the Student Study Guide and review with class.
Planning for an Emergency Ambulance Run (0:10) 0:05	1. Preplanning can save time and result in a more efficient service. 2. The EMT should make use of all information and knowledge available to him to minimize the time required to serve the patient as well as to maximize the care provided. a. ***Enroute to the scene.*** Questions include: 1) Is it necessary to exercise privileges of an emergency vehicle? Is it disaster?	Develop this section of the lesson with the class. Ask the class to use what they have learned thus far in the course to identify information that would aid them in making an efficient ambulance run.

Time (Elapsed) Actual	Contents	Instructor Notes

2) What is the shortest route? What time of day is it? Will time of day affect traffic on shortest route? Should alternate route be chosen? Are there disaster routes that should be used?

3) What are the weather conditions? How will weather conditions affect driving conditions or routes used?

4) If an emergency, what is the nature of the emergency—e.g., a vehicle accident, a fire, an explosion, a water accident, an electrical hazard?

5) What other emergency services might you expect to find at the scene?

6) If a home accident or illness, what sort of building is it? Are there elevators or must you use stairs? What sort of a stretcher should you take in with you?

7) What do you know about the nature of the illness or injury? What should you be prepared to take with you in terms of equipment or supplies when you leave the ambulance? For example, might you need oxygen, splints, an obstetrical kit?

8) What communications procedures may be required? Do you confirm that you are enroute? Should you confirm arrival at the scene? Will you need to obtain police assistance in getting you hurriedly through intersections or across narrow bridges?

b. ***At the scene***

1) Where is it best to park the vehicle—to permit easy access to the patient, to protect the patient?

2) What has happened? Who is there to help? What emergency care has been rendered? Are other emergency services needed?

3) Is traffic control necessary? Can you delegate traffic control to a bystander until police arrive? Do you need to set out flares? Do you need to establish blockades?

4) How many patients are there and what condition are they in? Are there any who must be removed from situations threatening their lives? If there are multiple patients, which ones need immediate care?

Patient Survey
(0:15)
0:05

1. **Stages.** As indicated previously, once at the scene, patient examination must be performed. It is performed in two stages:

a. Checking for and controlling life-threatening problems.

b. Checking for and stabilizing injuries/illnesses not threatening to life.

2. **Primary survey.** If there are multiple casualties, each patient should be checked and the EMT should administer only to those with life-threatening problems.

3. **Secondary survey.** When all patients are checked for life-threatening problems, each patient should be systematically checked for illnesses/injuries not threatening to life.

4. **Gaining information from the scene**

Ask class to identify

Time (Elapsed) Actual	Contents	Instructor Notes
	a. The EMT should be alert to the fact that information from the emergency scene can assist in making a diagnosis, for example:	stages and what would be checked in each stage.
	1) One might suspect heat or cold injuries in extremes of the environment.	
	2) A crushed steering wheel might indicate chest injuries, or severe internal bleeding due to a damaged liver.	
	3) A seat belt in place may indicate internal lower abdominal injuries, pelvic fractures or spine fractures.	
	4) A damaged dashboard might indicate facial fractures, skull injuries, or neck injuries.	Ask class for suggestions.
	5) The presence of liquor bottles or drugs might indicate alcohol or drug abuse.	
	b. The rescuer can also gain valuable information from witnesses, for example:	
	1) They may be able to describe what happened.	
	2) They may be able to tell whether patients have been moved from their initial positions following an accident.	
Triage (0:20) 0:10	1. **Definition.** Triage means sorting multiple casualties into priorities for emergency care or for transportation to definitive care.	
	2. **Priorities.** Priorities are usually given in three levels as follows:	
	a. ***Highest priority***	List on chalkboard. Ask class for suggestions.
	1) Airway and breathing difficulties	
	2) Cardiac arrest	
	3) Uncontrolled or suspected severe bleeding	
	4) Severe head injuries	
	5) Severe medical problems—poisonings, diabetic complications, cardiacs	
	6) Open chest or abdominal wounds	
	7) Shock	
	b. ***Second priority***	Ask class for suggestions.
	1) Burns	
	2) Major or multiple fractures	
	3) Back injuries with or without spinal cord damage	
	c. ***Lowest priority***	
	1) Fractures or other injuries of a minor nature	
	2) Obviously mortal wounds where death appears reasonably certain	
	3) Obvious dead	
Other Responsibilities at the Scene (0:30) 0:05	1. While analyzing and performing emergency care, the EMT must begin making plans for loading and transporting patients. This function includes:	Ask class for suggestions.
	a. Planning loading and transportation, e.g., some patients may be loaded while care is being administered to others	
	b. Obtaining assistance as necessary in loading vehicle	

Time (Elapsed) Actual	Contents	Instructor Notes
	c. Loading patients carefully to minimize aggravation of existing illnesses/injuries d. Determining best route for leaving the scene e. Determining to which hospital patients should be taken depending on facilities at hospital 2. The EMT must exhibit a calm and professional manner not only in dealing with the patient but also in controlling the situation as necessary, e.g.: a. Restraining bystanders from crowding or mishandling the patient b. Specifying tasks for volunteers c. Reassuring relatives d. Assuming functions of police when they are not present	
Delivery of Patient to the Hospital (0:35) 0:05	1. **Travel to the hospital.** Procedures include: a. Constant observation and care of patient, taking care to note any changes in vital signs b. Driving carefully to assure safety of patient and to minimize aggravation of illnesses/injuries c. Informing hospital that patient is being brought in d. Communicating changes in vital signs to hospital and obtaining information on care of patient as appropriate	Ask class for suggestions.
	2. **At the hospital.** Procedures include: a. Unload patient carefully b. Communicate verbally all information to hospital emergency department personnel c. Assist hospital emergency department personnel as necessary d. Complete records e. Have emergency department personnel sign for patient and his personal belongings as appropriate f. Exchange equipment and supplies with hospital as appropriate g. Now ready to return to inservice condition—return to home base, restore vehicle and supplies to ready condition, complete reports	Ask class for suggestions.
Practice—Review of Vital Signs (0:40) 1:20	*Note:* All of the vital signs have previously been discussed. This session should be conducted as a review exercise in which different students are asked to describe each sign, deviations from the normal and implications of these deviations. **Examples are given below.** It should be emphasized that **all** signs are used together with other information (what the patient says, what bystanders say, what the rescuer observes from the scene) in evaluating the nature of a given illness/injury.	*Note:* There are 3 parts to the practice session.
	1. **Pulse**	Ask students to describe each

Time (Elapsed) Actual	Contents	Instructor Notes
	a. ***Rapid, Strong:*** fright, apprehension, heat stroke b. ***Rapid, weak:*** shock, bleeding, diabetic coma, heat exhaustion c. ***Slow, strong:*** stroke, skull fracture d. ***None:*** cardiac arrest, death 2. **Respirations** a. ***Shallow:*** shock, bleeding, heat exhaustion, insulin shock b. ***Deep, gasping, labored:*** airway obstruction, chest injury, diabetic coma, heart disease c. ***Note:*** respiratory arrest due to any number of illnesses/injuries d. ***Bright, frothy blood coughed up:*** lung damage possible due to fractured ribs or penetrating objects 3. **Skin temperature** a. ***Cool, moist:*** shock, bleeding, heat exhaustion b. ***Cool, dry:*** exposure to cold c. ***Hot, dry:*** heat stroke, high fever 4. **Face color** a. ***Red:*** high blood pressure, carbon monoxide poisoning, heat stroke, diabetic coma b. ***Pale/white/ashen:*** shock, bleeding, heat exhaustion, insulin shock c. ***Blue:*** heart failure, airway obstruction, some poisonings *Note:* Blue results from poor oxygenation of circulating blood. For people with dark skin pigmentation, blue may be noted around the finger nails, palms of hands and mouth. 5. **Pupils of the eyes** a. ***Dilated:*** shock, bleeding, heat stroke, cardiac arrest b. ***Constricted:*** opiate addiction c. ***Unequal:*** head injury, stroke 6. **State of consciousness** a. ***Confusion:*** most any illness/injury, fright, apprehension, alcohol, drugs b. ***Coma:*** stroke, head injury, severe poisoning, diabetic coma 7. **Inability to move upon command**—an indicator of paralysis. a. ***One side of body:*** stroke, head injury b. ***Arms and legs:*** damage to spinal cord in neck c. ***Legs:*** damage to spinal cord below neck 8. **Reaction to physical stimulation**—an indicator of paralysis a. ***No sensation in arms and/or legs:*** damage to spinal cord as indicated above	sign, deviations from the normal and implications of the deviations.

Time (Elapsed) Actual	Contents	Instructor Notes
	b. ***Numbness in arms and/or legs:*** damage to spinal cord as indicated above *Note:* No sensation or indication of pain when there is an obvious injury can also be due to hysteria, violent shock, or excessive alcohol or drug use. 9. **Blood pressure**—a marked drop is an indicator of shock.	
Practice—Patient Description	1. The instructor should identify various illnesses/injuries covered in the course. For each case, students should describe a "patient." The description should include the patient's general appearance, vital signs, and general condition.	
Practice—Patient Assessment (2:00)	1. Working on simulated victims, each student should practice patient assessment. He should describe what he is doing, implications of his findings and actions to be taken. He should establish rapport and maintain communications with conscious patients and obtain information from bystanders (the instructor) as needed. Performance should include, as appropriate, checking for life-threatening problems and making a systematic survey for illnesses/injuries not threatening to life.	While reviewing vital signs and discussing patient cases, rotate students through the victims' stations so that each student examines each victim. Have students rank order the victims for triage purposes at the conclusion of the rotation.

Lesson 23

Situational Review

Objective

Provide the student with an opportunity to apply selected knowledge learned in the course by group discussion of situational examples

Requirements

There are no special requirements for this lesson.

Instructor Tasks

1. Review the situational examples provided in the lesson outline.
2. Prepare additional examples and questions as desired.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	
Introduction (0:05) 0:05		Review lesson objective.
Situational Review (0:10) 2:50	*Note:* The situations listed below have been developed to aid the instructor in providing an integration and review of course contents. Included also are examples of questions that the instructor might pose to the class. The questions posed do not necessarily have clear-cut answers; rather, they are designed to stimulate class discussion. The instructor should feel free to draw on his own experiences in developing situations if he so desires. The instructor should assure that all class members participate in the discussion. **Situation 1** An ambulance is the first emergency vehicle to arrive at the scene of a two-car collision. Both cars are upright. A quick survey of life-threatening problems has revealed the following patients: ***Car 1:*** The driver is unconscious and seated in the front seat fastened in his seat belt. The head of the passenger in the front seat has been thrown through the windshield. He is bleeding profusely about the face, is unconscious and his respirations are shallow. ***Car 2:*** The driver is seated in the front seat. He is sweating and appears to be short of breath. He complains of pain in his chest and left arm. The passenger has been thrown from the car. He is lying on the road moaning that he cannot move his legs. He appears to feel no sensation in his legs. ***Questions:*** a. What might be wrong with each patient? b. Which two patients (there are two EMT's) should be treated first and why? c. What care should be given to each patient? d. Which two patients should be transported first and why? e. Would it be necessary to alert the hospital and why? f. Would the trip to the hospital be made with utmost speed and why? **Situation 2** An unconscious person is found on a city street. His skin is pale and moist and his pulse is rapid. He is having convulsions. ***Questions:*** a. What might be wrong with the patient?	Hand out prepared list of situational examples. Read the first example out loud. Ask the first question and discuss responses. Continue through the list of questions and situations. Include two 10-minute breaks during the discussion session.

b. What should be searched for?

c. What care should be given to the patient?

Situation 3

There has been a brawl at the local tavern. One patient is lying on the floor with a knife in his chest. He is bleeding profusely and coughing up frothy blood. Patient No. 2 is unconscious, his respirations shallow, his pulse weak, and blood is dripping from his ears and nose. Patient No. 3 has an angulated compound fracture of the tibia and is bleeding profusely at the fracture site.

Questions:

a. What is most likely wrong with patient No. 1?

b. What is most likely wrong with patient No. 2?

c. Which two patients should be cared for first and why?

d. Should help be enlisted in caring for the patients?

e. What care should be provided for each patient?

f. Which two patients should be transported first and why?

g. Would it be necessary to alert the hospital and why?

h. Should the trip to the hospital be made with utmost speed and why?

Situation 4

A man has barricaded himself in the bathroom. There have been sounds of water running. When you arrive at the man's apartment, the police have just succeeded in opening the bathroom door. They tell you they have heard no sounds for five minutes. You find the patient face down in the bathtub. He is not breathing, has no pulse and his pupils are dilated and fixed.

Questions:

a. What care should be provided for the patient?

b. You have performed cardiopulmonary resuscitation on the patient for 10 minutes without reviving him. Should you cease your efforts and why?

c. What information should you obtain and to whom should you give it?

Situation 5

You are returning from the hospital and a violent thunderstorm erupts. You come across a car on which some electric wires have fallen. The driver is opening the front door of the car.

Question:

a. What should be done and why?

Situation 6

You have taped up a sucking chest wound and are transporting the patient to the hospital. You notice that the patient's respirations are worsening.

Questions:

a. What would you suspect is wrong with the patient?

b. What would you do?

Situation 7

You arrive at a private home and find a woman ranting that

her husband plans to kill her and she is going to throw acid at him. You try to calm her from a distance and to keep her husband at a distance. However, he approaches her and she throws the acid in his face.

Questions:

a. What would you suspect is wrong with the wife?

b. How would you care for the husband and wife?

c. What would you do about transporting the two patients?

d. What information should you be sure to obtain and to whom should you give it?

Situation 8

You have been called to a building where there is no known elevator. There is a patient on the third floor having a severe asthmatic attack.

Questions:

a. When you leave the ambulance, what equipment should you take with you and why?

b. When you see the patient, you administer oxygen and his respirations worsen. What would you suspect is wrong and why?

c. How would you carry this person?

d. How would you care for him enroute?

Situation 9

You have been called to take a pregnant woman to the hospital to have a baby.

Questions:

a. When you leave the ambulance, what equipment should you take with you and why?

b. You find the woman crowning when you arrive. What should you do to assist her in the delivery?

c. How should you care for the baby?

Situation 10

An unconscious patient has severe third-degree burns of the head, face and neck, His respirations are irregular and his pulse is weak.

Question:

a. How would you care for the patient?

Situation 11

You are following a car that veers suddenly onto the shoulder of a limited access highway, up an embankment, turns over onto its roof. You can see two people inside dangling in their seat belts and shoulder harnesses.

Questions:

a. What should be done first and why?

b. You have assured that the vehicle is shored up and stable. You find the door on the driver's side unlocked, and you open it to gain access to the victims. What should you do next and why?

c. You find each occupant unconscious. Each is breathing and has no obvious open wounds. How would you remove them from their belts and harnesses?

d. From the information presented, what might have happened to the driver? How would you check?

Situation 12

The left window of the vehicle is smashed and the driver has a large piece of glass penetrating his left cheek and is bleeding profusely from the left cheek and forehead. He is unconscious and fastened in his seat belt.

Questions:

a. How would you care for the patient?

b. What other injuries might you suspect the patient to have and how would you check for them?

Situation 13

A car has been traveling slowly when it suddenly veers off the road, grazes a tree and comes to rest against another tree. The driver is barely conscious. He does not speak and appears to have no feeling on one side of his body.

Questions:

a. What is most likely wrong with the driver?

b. How would you care for him?

Situation 14

The driver is unconscious. He is fastened in his seat belt. There is dark red blood oozing from his mouth. The passenger in the front seat has an open fracture of the left tibia and is bleeding profusely at the fracture site.

Questions:

a. What is most likely wrong with the driver?

b. Which patient would you care for first and why?

c. How would you care for each patient?

d. While you are working on these patients, you hear a moan and discover a child on the floor of the back seat. You have to remove one patient from the vehicle to gain access to the child. Which patient would you move? How would you move him?

e. The child is barely conscious and has a closed angulated fracture of the shaft of the humerus. How would you care for him?

Situation 15

A car slows down suddenly and comes to a stop at the side of the road. The window is open on the driver's side. The driver's face appears grotesquely swollen and he is barely breathing.

Questions:

a. What would you suspect might have happened?

b. What would you do for the patient?

Situation 16

Much smoke is coming from a structural fire. On entering the doorway, you notice the universal radiation symbol and see a man lying on the floor 20 feet away.

Questions:

a. What environmental hazards are likely?

b. What safety precautions should be taken?

c. What modifications should be made in usual patient care and transportation?

(3:00)

Lesson 24

Final Written Test

Objectives

Administer a written test to evaluate student attainment of the knowledge objectives of the course

Requirements

Material:

Written test (one for each student)

Instructor Tasks

It is assumed that instructors for individual lessons will assist the course coordinator in developing written test items for the lessons they teach. It will be the responsibility of the course coordinator to assemble a balanced test that is directed toward assessing whether or not the knowledge objectives of the course have been achieved.

The instructor for this lesson serves largely as a monitor of the test itself. He should assure that he has sufficient copies of the test for each student and should review all procedures for completing the test so that he can explain these procedures correctly to the students.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (--) 0:05	1. Student attendance 2. Announcements Etc.	
Test Administration (0:05) 1:55		Distribute test. Explain procedures for taking the test. Collect completed papers.
(2:00)		

Lesson 25

Final Practical Evaluation of Skills

Objectives

Evaluate student attainment of the skill objectives specified for the emergency care course

Note: The skills listed below have been selected for the final practical examination as being representative of the skills covered in the emergency care course. Time permitting, of course, the instructor could include all skills covered in the course.

Immobilizing a seated patient on a short backboard

Performing a patient examination

Setting up, administering and shutting down oxygen equipment

Bandaging the eye, skull, elbow and forearm

Immobilizing fractures of the humerus, ulna and femur

Performing one- and two-man cardiopulmonary resuscitation on an adult manikin

Performing a two-man direct ground lift

Immobilizing a patient on a long backboard

Taking a patient's blood pressure

Assisting in a childbirth—normal delivery

Requirements

Equipment/material:

Checklist (one for each student for each skill included in the evaluation session)

Oxygen equipment and delivery system (one for each 6 students)

Adult cardiopulmonary resuscitation manikin (one for each 6 students)

Paper cup/cone or eye shield (one for each two students)

Universal dressings (one for each two students)

Gauze pads (one for each two students)

Rigid splints (one set for each two students)

Traction splint (one for each three students)

Long board splint (one set for each three students)

Blanket (one for each three students)

Cervical collar (one for each 6 students)

Short backboard with associated straps (one for each 6 students)

Long backboard with associated straps (one for each 6 students)

Roller-type bandages (one for each two students)

Triangular bandages (four for each student)

Bandage shears (one for each 4 students)

Sphygmomanometer and stethoscope (one for each 6 students)

Stretcher (one for each 6 students)

Obstetrical manikin (one for each 6 students)

Sterile delivery pack (one for each 6 students)

Adhesive tape (one for each 6 students)

Instructors:

Two instructors for each 6 students.

Note: Additional instructor aides should be available to serve as victims for evaluation of the skill of patient examination.

Note: If there are fewer instructors or less equipment than specified, additional time will be required for this lesson.

Instructor Tasks

In order to assure that all students are evaluated in the same manner, the instructor should have a checklist on which he can check off the principal features of the skill to be evaluated. This checklist essentially comprises the student's evaluation sheet. It is assumed that the checklist will be prepared by the instructor and course coordinator. At this point, a library of checklists for the emergency care course should be available since they have been developed for four previous practice, test and evaluation sessions. All instructors should be briefed on checklist use.

Detailed procedures are not specified for the lesson since they will vary depending on the number of students in the class, the number of instructors and the amount of material available. It is suggested that the instructors divide among themselves the skills to be evaluated. In effect, the lead instructor should set up test stations. He should also assure that all materials required for the lesson are available.

All instructors should be thoroughly briefed on their responsibilities. Each instructor should review all lesson plans and all references for the emergency care course.

Time (Elapsed) Actual	Contents	Instructor Notes
Administrative Matters (–) 0:05	1. Student attendance 2. Announcements Etc.	
Evaluation of Skill Objectives (0:05) 2:55	1. The instructor should use a checklist in evaluating student proficiency in performing the following skills.	Explain procedures to be followed in the evaluation session.
	a. ***Patient examination.*** Working on simulated victims, each student should perform patient examinations and provide (or describe as appropriate) proper emergency care.	
	b. ***Oxygen equipment.*** Working on a manikin or instructor, each student should set up, administer and close down oxygen equipment.	
	c. ***Bandaging - I.*** Working in pairs, one student should bandage an eye with a protruding eyeball. The other student should bandage a depressed skull fracture.	
	d. ***Bandaging - II.*** Working in pairs, one student should bandage the forearm. The other student should bandage the elbow.	
	e. ***Fractures - I.*** Working in pairs, one student should apply a rigid splint to the humerus. The other student should apply a similar splint to the ulna.	
	f. ***Fractures - II.*** Working in pairs on an instructor or fellow student, students should apply both a traction splint and a long board splint to immobilize a fracture of the femur. Each student should perform in both positions (e.g., maintaining traction and applying the splint).	
	g. ***One-man cardiopulmonary resuscitation.*** Each student should demonstrate successful cardiopulmonary resuscitation of a manikin for a minimum of two minutes.	
	h. ***Two-man cardiopulmonary resuscitation.*** Working in pairs, students should demonstrate successful cardiopulmonary resuscitation of an adult manikin for a minimum of two minutes. Performance should include changing positions.	
	i. ***Lifting and moving.*** Working on an instructor or fellow student, each **pair** of students should lift the patient from the floor, using a direct ground lift, and position him properly on a stretcher.	
	j. ***Immobilization on a short backboard.*** Working in pairs on an instructor or fellow student, each student should immobilize a patient on a short backboard.	
	k. ***Immobilization on long backboard.*** Working on an instructor or fellow student, each **pair** of students should move a patient with a suspected spine fracture from the floor to a long backboard.	
	l. ***Blood pressure.*** Working on an instructor or fellow student, each student should determine the patient's blood pressure.	
	m. ***Normal childbirth.*** Working on an obstetrical manikin, each student should assist in a normal delivery.	Maneuver infant manikin.
(3:00)		

Appendix

References Used in Development of Course Lessons

Lesson		Reference*
1.	Introduction to emergency care training	AAOS: Chapters 1, 2, 3, 4, 5, 7, 13, 15, 21, 25, 28
2.	Airway obstruction and respiratory arrest	AAOS: Chapters 5, 10 JAMA
3.	Cardiac arrest	AAOS: Chapters 7, 10 JAMA
4.	Mechanical aids to breathing and resuscitation	AAOS: Chapters 10, 11 JAMA
5.	Bleeding, shock and practice in skill taught in Lessons 2-4	AAOS: Chapters 4, 7, 8, 9
6.	Practice, test and evaluation	References cited to date
7.	Wounds	AAOS: Chapters 12, 14, 17
8.	Fractures of the upper extremity	AAOS: Chapters 4, 13, 15, 16, 17, 18
9.	Fractures of the pelvis, hip and lower extremity	AAOS: Chapters 4, 17, 19
10.	Injuries of the head, face, neck, spine	AAOS: Chapters 20, 21, 22, 24, 47 Patient handling manual: Chapter 7
11.	Injuries to eye, chest, abdomen, genitalia	AAOS: Chapters 6, 23, 24, 25, 26, 28, 29
12.	Practice, test and evaluation	References cited to date

*Abbreviations are listed here; for complete reference, see "instructor tasks" pages of the course lessons.

Lesson	Reference*
13. Practice, test and evaluation	References cited to date
14. Medical emergencies I	AAOS: Chapters 30, 31, 33, 45
15. Medical emergencies II	AAOS: Chapters 27, 32, 34, 35, 37, 38, 39 ARC: Drugs and their abuse
16. Emergency childbirth	AAOS: Chapter 36
17. Environmental emergencies	AAOS: Chapters 40, 41, 42, 43, 44
18. Lifting and moving patients	Patient handling manual: Chapters 1, 2, 4, 5, 6, 7 AAOS: Chapter 47
19. Field exercise: extrication from automobiles	AAOS: Chapter 47
20. Practice, test and evaluation	References cited to date
21. Operations	AAOS: Chapters 48, 49, 50
22. Responding to an ambulance call	References cited to date
23. Situational review	References cited to date
24. Final written test	References cited to date
25. Final practical evaluation of skills	References cited to date